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Forecasting Contraceptive Demand

Fertility Trends in Malaysia
Sterilization Counseling in Nigeria

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UPDATE

Brazil's Singular AIDS Patterns

The AIDS epidemic in Brazil seems to be spreading in a unique way, representing a combination of the patterns seen in Africa and in the Western developed nations.[1] The prevalence of HIV-1 is highest among homosexual male prostitutes, wives of hemophiliacs and bisexual men. According to a recent serologic study, bisexual men may be acting as a bridge for the virus between the homosexual and heterosexual populations, a role filled by intravenous drug users in developed countries. The study also made the troubling finding that the rare HIV-2 strain has already been introduced into Brazil. The pattern of AIDS transmission identified in the study could lead to a rapid rise in infection rates among heterosexuals, especially women.

1. E. Cortes et al., "HIV-1, HIV-2 and HTLV-I Infection in High-Risk Groups in Brazil," *New England Journal of Medicine*, **320**:953, 1989.

Roots of Kenya's High Fertility

In Kenya, which has one of the highest natural growth rates in the world (4.1 percent annually[1]), early age at first marriage is closely associated with high fertility. A multivariate analysis using data from the Kenya Fertility Survey of 1977–1978 shows that women who marry between the ages of 10 and 17 have at least 0.6 more children than those who wait until age 23 or older.[2] Oddly enough, the study also found contraceptive use to be positively associated with fertility, since most of the women who practice contraception do so to limit their already large families. Of all the variables examined—level of education, place of residence, marriage disruption, religion, contraceptive use and work status—none had as large an impact as age at first marriage, although educational attainment was a close second. According to the investigators, any attempt to raise the legal age at marriage would probably falter in African society, where the tradition of early marriage is deeply rooted. Instead, high fertility could be more readily brought down by providing opportunities for higher education and employment as alternatives to early marriage.

1. Population Reference Bureau, *1989 World Population Data Sheet*, Washington, D.C., Apr. 1989.

2. W. K. A. Agyei and I. Mbamanya, "Determinants of Cumulative Fertility in Kenya," *Journal of Biosocial Science*, **21**:135, 1989.

A World Growing Ever Larger, Faster

For anyone who wants up-to-date, comprehensive population data for every continent, region and country, the source has arrived—the *1989 World Population Data Sheet*.[1] But although the updated version is welcome, much of what it tells us is not: The world's annual growth rate edged up to 1.8 percent in 1989 from 1.7 percent in 1988, and the total population is estimated to have grown by 250 million since the world's population passed the five billion mark in 1987. The projected world population totals for the years 2000 and 2020 have also been adjusted upward, with China and India together now expected to contain almost three billion people by 2020. Those interested in receiving a copy of the data sheet should write to the Population Reference Bureau, P.O. Box 96152, Washington, D.C., 20090, USA.

1. "Growth Rate Nudges Up Again," *Population Today*, May 1989, p. 4; and Population Reference Bureau, *1989 World Population Data Sheet*, Washington, D.C., Apr. 1989.

Development Key to Longer Life

In less developed countries, socioeconomic development appears to be more influential than public health measures in bringing about a decline in mortality. In the latest contribution to an ongoing debate, a recent study contrasting the influence of urbanization, industrialization and education with that of access to safe water and physicians and adequate nutrition indicates that although both sets of factors directly affect life expectancy, the impact of the socioeconomic variables is stronger.[1] The socioeconomic factors contributing most to the variations in life expectancy are literacy and the proportion of the population engaged in agriculture; of the public health variables, safe water has the greatest impact. Curiously, the study also shows that urbanization is negatively related to life expectancy. According to the researchers, developing countries may be repeating the history of the now developed nations, where, during their early period of urbanization, cities were overcrowded, unsanitary and unhealthy places to live.

1. R. G. Rogers and S. Wofford, "Life Expectancy in Less Developed Countries: Socioeconomic Development or Public Health?" *Journal of Biosocial Science*, **21**:245, 1989.

Asking the Unaskable Around the World

The World Health Organization (WHO) plans to query Belgian housewives, Greek sailors and Ugandan truck drivers about their sex lives. People from at least 17 other countries will also be surveyed as part of WHO's efforts to gather enough information about human sexuality worldwide to solve some of the mysteries surrounding the variation in the spread of the AIDS virus.[1] Among the many developed and developing countries that have already agreed to participate are Belgium, Brazil, Costa Rica, Greece, the Ivory Coast, Kenya, the Netherlands, Nigeria, Senegal, Sri Lanka, Thailand and Uganda.

Fielding such a survey will not be easy—besides the usual problems associated with obtaining valid random samples, the subject matter makes it unlikely that some of the world's more conservative nations will want to join in. Language poses another obstacle, as the survey will have to be sensitively translated not only into the world's

major languages but into a myriad of cultural and tribal dialects as well. But perhaps the greatest uncertainty lies with the truth of the responses—can people be trusted to answer honestly about their sexual behavior?

1. "WHO Seeks Global Data on Sexual Practices," *Science*, **244**:418, 1989.

Korea Cracks Replacement Level

In 1988, the total fertility rate in Korea fell to a remarkable 1.6 births per woman, according to the most recent national survey from the Korea Institute for Population and Health.[1] Korea's total fertility rate now seems well below replacement level, a feat that has only been achieved in a few developed nations. The correspondingly low annual population growth rate dropped to one percent in 1988, from 2.9 percent in 1955–1960 and 1.6 percent in 1980. The survey also registered further increases in contraceptive use: Korea now has an overall contraceptive prevalence rate of 77 percent among all currently married, fecund women. Sterilization is the method of choice in Korea, with reliance on vasectomy having almost doubled in 10 years (from six percent in 1979 to 11 percent in 1988) and the prevalence of female sterilization having grown from 15 to 37 percent over the same period. According to the survey, reliance on the condom also doubled during the 10-year span (from five to 10 percent), while use of the IUD declined slightly (from 10 to seven percent) and pill use fell substantially (from seven to three percent).

1. "Prevalence of Contraceptive Use and Fertility," *Korea Institute for Population and Health Bulletin*, No. 16, June 1989, p. 1.

UN Convention Causing Commotion

The proposed preamble to the United Nations Convention on the Rights of the Child is causing concern among many nations that would otherwise gladly ratify it. The draft version of the Convention contains a vaguely worded commitment to protect children "before as well as after birth."[1] A desire to have the Convention ready in time to coincide with the 30th anniversary of the original Declaration of the Rights of the Child (passed in November 1959) influenced the decision to retain the clause, which reportedly was promoted by right-to-life groups. Given that the Convention will be legally binding on all ratifying nations, some member countries fear that the clause could be used as a political weapon, and could also infringe on women's reproductive rights. At the very least, the wording will cause a great deal of confusion among the ratifying countries, especially since another UN Convention guarantees a woman's right to decide on the number and spacing of her children. In addition, the International Planned Parenthood Federation has pointed out that the clause has absolutely nothing to do with the children's rights that are set down in the Convention itself.

1. "Draft of U.N. Child Rights' Convention Flawed," *IOICFP News*, No. 179, May 1989, p. 7.

Microspheres Pass Early Test

A new type of injectable contraceptive consisting of norethindrone microspheres is now one step closer to being ready for use. A Phase II multicenter study comparing 65 mg and 100 mg doses of a slow-release, injectable hormonal contraceptive active for 90 days has determined that 65 mg is the minimal effective dose, and that the 100 mg dose should be as reliable as the most effective injectable or oral contraceptive available.[1] The two doses tested were comparable in terms of the type of side effects the women experienced, their patterns of vaginal bleeding, and laboratory measures of hemoglobin levels, liver function and other metabolic indicators. Over the course of the six-month randomized trials, no pregnancies were reported in the 100 mg group, compared with one in the group using the 65 mg injection. Because of the limited experience with the latter dose, however, further testing will be required before the associated pregnancy rate of 2.6 per 100 woman-years can be accepted with confidence. The researchers expect that the norethindrone microspheres will be submitted to the U.S. Food and Drug Administration for approval once the ongoing animal studies and Phase III clinical trials are completed.

1. G. S. Grubb et al., "A Comparative Evaluation of the Safety and Contraceptive Effectiveness of 65 mg and 100 mg of 90-day Norethindrone (NET) Injectable Microspheres: A Multicenter Study," *Fertility and Sterility*, **51**:803, 1989.

Breastfeeding Protects Infant Health

Breastfeeding provides a sizable degree of protection against infant diarrheal mortality, according to a recent case-control study conducted in two Brazilian cities.[1] Compared with breastfeeding, bottle-feeding multiplied the risk of death from diarrhea 14 times, while alternating breast milk with cow's milk or powdered milk increased the risk four times. Breastfeeding's protection appears strongest in the first months of life, when the immune system is least able to fight off diarrheal infections. Furthermore, there is a direct relationship between the number of times a mother breastfeeds and the probability that her infant will die as a result of diarrhea: For each additional episode of breastfeeding per day, the risk of mortality is reduced by 20 percent. Besides avoiding the need to use water that is often contaminated for reconstituting powdered milk, diluting cow's milk and washing utensils, breastfeeding appears to protect the gastrointestinal track from infection. The investigators estimate that among infants under two months old, diarrheal mortality in Brazil could be reduced by 63 percent if infants were given only breast milk.

1. C. G. Victoria et al., "Infant Feeding and Deaths Due to Diarrhea," *American Journal of Epidemiology*, **129**:1032, 1989.

Dissolvable Implant Tested

Early tests of Capronor, a biodegradable contraceptive implant, indicate that the method works for about a year, delivering a steady dose of levonorgestrel from a small rod placed in the user's arm.[1] In a year-long study of 48 healthy, sexually active women of reproductive age, 16 were given a rod 2.5 cm long and 32 received a rod 4.0 cm long. Serum levels of progesterone obtained from 10 women in each group showed that the smaller rod consistently failed to prevent ovulation, while the larger rod suppressed ovulation nearly 75 percent of the time. Most women who ovulated had regular bleeding patterns, while a majority of the others bled irregularly. There was one pregnancy among women using the smaller rod and two among women using the larger rod. The researchers assume that the women who did ovulate were protected from pregnancy by hormone-induced changes in the endometrium and cervical mucus.

After eight months of use, levels of serum levonorgestrel were so low in the group with the 2.5 cm rods that insertion of a second rod was required. The researchers therefore concluded that the 4.0 cm size may be the minimal functional length. A second trial of Capronor is planned for early 1990. One of Capronor's potential advantages over NORPLANT® (now being used in many countries) is that it dissolves and thus does not require surgical removal.

1. P. D. Darney et al., "Clinical Evaluation of the Capronor Contraceptive Implant: Preliminary Report," *American Journal of Obstetrics and Gynecology*, **160**:1292, 1989.

Changing Patterns of Fertility and The Supply of Contraceptive Commodities

The largest increases in contraceptive prevalence are projected to occur in Africa, where pill needs in the year 2000 will increase fourfold over the 1985 level and where the need for condoms will increase over five and a half times.

By Peter J. Donaldson and Shubha Ghosh

Summary

Growth in contraceptive use and in the number of couples of reproductive age will greatly increase the demand for contraceptive supplies in the developing world. The largest increases in contraceptive prevalence are projected to occur in Africa, where pill supplies will have to increase from 47 million cycles in 1985 to 199 million cycles in the year 2000 if that continent maintains current patterns of method preference and achieves the medium variant total fertility rates projected by the United Nations. In Asia, IUD use will grow from 286,000 units to almost 1.4 million units during that period, and condom use will increase from 715 million to almost two billion units. The need for contraceptive commodities will also expand in Latin American, but not by as much as in other regions.

Results of a projection indicate that the U.S. Agency for International Development (AID) will have to increase its pill supplies to Africa by over 300 percent to supply the same proportion of demand in 2000 that it did in 1985. It would have to expand condom supplies to Africa by more than 200 percent, to Asia by some 170 percent and to Latin American by almost 100 percent. Because of an apparent oversupply of IUDs, less growth in demand for this device is anticipated. Among the implications of these findings are a need for realistic country-specific projections of the growth in contraceptive commodities, as well as a need for planning how AID, other donors and developing countries, themselves, will meet the expanded costs.

Peter J. Donaldson is with The Population Council, and Shubha Ghosh is a member of the Department of Economics at the University of Texas at Austin. The authors, who prepared this article while working at the National Academy of Sciences, express their appreciation to John Bongaarts, Harry Cross, Charles Keely and Amy Tsui for their valuable comments on an earlier draft; to Charles Keely and Julia Friend for assistance in collecting and compiling the data used in the article; and to Bonita Blackburn for her efforts to provide information on contraceptives supplied to developing countries by the Agency for International Development.

Introduction

Two widely observed trends will influence future demand for contraceptives in the developing world. First, desire to limit family size and to control birthspacing, already widespread in many developing countries, is likely to continue and even increase in many areas. Second, population growth will persist throughout the developing world between now and the end of the century.[1] This combination of increased interest in fertility control and overall growth in the number of reproductive-age couples means a substantial increase in the demand for contraceptive services of all sorts, but especially for pills, IUDs, condoms and sterilization equipment.

Table 1 presents data that illustrate the increases in population, the declines in fertility and the growth in contraceptive prevalence expected between 1985 and the year 2000 in the major regions of the developing world. During this time, the number of married women will grow by more than 50 percent in Africa, by almost 40 percent in Latin America, by about 25 percent in East Asia and by 32 percent in South Asia. The total fertility rate is projected to decline hardly at all in East Asia and slightly in Africa (13 percent), but the declines in total fertility will be large in Latin America and South Asia (23 percent and 32 percent, respectively).

The achievement of these fertility levels implies a significant growth in contraceptive prevalence rates and in the number of contraceptive users. The projections in Table 1 show that the contraceptive prevalence rate will almost double in Africa and increase by 64 percent in South Asia. The increase will be much smaller in Latin America (27 percent) and almost nil in East Asia. In Africa, the number of women practicing contraception will climb from 12 million in 1985 to 35 million in the year 2000, an increase of nearly 200 percent. In Latin America, the number of users will increase by 76 percent during that period, in East Asia by 31 percent and in South Asia by 118 percent.

Although there are a variety of reasons for expecting downward trends in fertility to continue, major increases in contraceptive use are almost always assumed to be a central element. Changes in the age at marriage, in the proportion married or in the utilization of abortion and breastfeeding will also help determine future trends

Table 1. Measures of reproductive trends, by region, 1985–2000

Measure and region	Year		
	1985	1990	2000
Married women 15–49 (in millions)			
Africa	96	111	148
Latin America	68	77	94
East Asia*	184	209	233
South Asia	265	293	351
Total fertility rate			
Africa	6.4	6.2	5.6
Latin America	3.9	3.6	3.0
East Asia*	2.0	2.0	1.9
South Asia	4.4	3.9	3.0
Contraceptive prevalence rate			
Africa	12	15	23
Latin America	49	54	62
East Asia*	74	77	77
South Asia	33	41	54
Women practicing contraception (in millions)			
Africa	12	16	35
Latin America	33	41	58
East Asia*	137	160	180
South Asia	87	120	190

*Excluding Japan.

Source: J. Bongaarts, "Implications of Fertility Trends for Contraceptive Practice," *Population and Development Review*, 10:341, 1984, Tables 3 and 4; and J. Bongaarts, personal communication, 1988.

in fertility, but most analysts cite greater use of modern contraceptives as the key factor in the future fertility of women in the developing world.[2]

Increases in the prevalence rate of modern contraceptive methods over the past two decades have already caused a substantial growth in the demand for contraceptive commodities in developing countries. The number of married women in the developing world who use contraceptives increased from a few million in 1960 to approximately 400 million in 1985.[3] Throughout this period of rapid growth in the prevalence of modern methods of fertility control, the products used by developing-country women were often provided by international organizations geared to development assistance.

The problem of providing adequate supplies to a given family planning program without needless waste is an important and under-studied issue. The expected increases in the need for contraceptive commodities, the inevitable growth among cohorts of married women of reproductive age and the reliance of family planning programs in so many developing countries on donor-supplied contraceptives requires that more attention be given to the collection and analysis of data on contraceptive supplies. Some work has started recently,[4] but much more needs to be done.

This article provides one forecast of the probable demand for contraceptive commodities in the developing world between 1985 and the year 2000, a reasonable time frame for examining the impact of changing demographic behavior and potential public policy responses to those changes. It also illustrates the effect that changing patterns of fertility will have on the demand for contraceptive commodities from the U.S. Agency for International Development (AID), the largest international donor of contraceptive commodities. Using information on shipments of such commodities by AID and data on current contraceptive prevalence from developing countries themselves, we offer an estimate of the number of women currently using U.S.-supplied contraceptives and project the changes that will be necessary if AID is to keep pace with the growth in contraceptive use in developing countries. Our purpose is not to argue for a particular forecast, but to call attention to the rapidly increasing need for contraceptive commodities in the developing world and to the importance of country-specific analyses of future demand and of ways to meet that demand.

Data and Methodology

To evaluate the way changing demographic behavior may affect the demand for contraceptives supplied by international donors, we projected the demand for contraceptives by country and contraceptive method using the target-setting model developed by John Bongaarts.[5] Beginning with 1985 data on the number of women of reproductive age, the proportion who were married, total fertility rates and contraceptive prevalence, we used the model to determine the changes in contraceptive prevalence that would be needed to meet specific projected total fertility rates. We used the medium variant total fertility rate for the year 2000 developed by the United Nations as the target fertility rate for each country and then calculated the number of acceptors and users of various contraceptive methods required to meet this target.[6]

In our calculations, we assumed that abortion was not practiced and used the procedures established by Bongaarts and John Stover[7] to estimate trends in sterility and the duration of postpartum infecundability. We also assumed that the net effects on fertility of changes in the proportion of married women in the population, in postpartum infecundability and in the use of abortion as a means of fertility control between 1985 and 2000 would be zero. It has been previously demonstrated that this assumption simplifies the analysis and does not introduce significant distortion.[8]

The calculations are also based on the assumption that the country-specific "mix" of contraceptive methods would remain the same in the year 2000 as it was in 1985—that is, that the same proportions of married women practicing fertility regulation would be using each specific method in both years. This assumption has the advantage of yielding more conservative projections of future contraceptive demand than the alternative premise—that there will be a shift to greater use of modern methods as fertility control values spread in a society and contraceptive prevalence increases. Changes in method mix, especially increases in the proportion using modern contraceptives (particularly sterilization), are evident in many countries and are likely to continue. However, barring significant changes in economic, technological and cultural factors, country-specific contraceptive use over the next 15 years is likely to reflect the patterns already established.

Although the analysis illustrates the issues faced by all donors and national family planning programs, we concentrate on the contraceptive commodities supplied by AID because of the size and influence of the agency's program. In FY 1987, for example, AID spent $35.6 million on contraceptive commodities. These are provided to developing countries in two ways. First, AID's Office of Population in Washington, D.C., annually purchases and distributes several million dollars worth of contraceptive supplies. In 1987, for example, the Office of Population spent $10.6 million on contraceptives, most of it through grants to U.S.-based family planning and population organizations that provide contraceptives overseas. Second, AID offices or missions in developing countries may request contraceptive shipments, which are then paid for from regional, as opposed to central office, funds. In FY 1987, AID missions purchased $25.0 million worth of commodities in this way.[9] (These figures refer to 1987 "obligations"; actual expenditures would be somewhat different.)

Data for this analysis were obtained primarily from contraceptive shipment schedules supplied by AID's Office of Population. The schedules provide data by contract year, method and country. Some AID-purchased commodities are not accounted for in these schedules. Consequently, we tried to collect additional data from major AID grantees but were only partially successful. The Pathfinder Fund and Family Planning International Assistance provided information, but other major grantees did not. In addition, some contraceptive commodities are supplied by AID-supported organizations other than those we contacted; however, these represent a very small share of the total amount provided by AID.

Various AID documents provide somewhat different figures on the amount of contraceptives provided to individual countries. In part, this is because it is extremely difficult to keep precise account of a contraceptive program involving millions of units purchased in different ways and shipped between the United States and over 50 developing countries, in operations involving numerous nongovernmental organizations, contraceptive manufacturers, shipping and storage firms and a host of family planning, regulatory, pharmaceutical and transport organizations. The schedule of shipments is regarded by AID staff as the most reliable source of information, mainly because it covers commodities actually transferred overseas.

Our analysis includes most of the countries to which AID provided pills, IUDs and condoms in 1985. We omitted some small Caribbean states (e.g., St. Kitts) and

a few places for which the data seem particularly weak (e.g., Chile). Taken together, the excluded countries account for approximately two percent of the value of contraceptive commodities shipped in FY 1986.[10]

We began our analysis by trying to determine the proportion of all contraceptives used in a particular country in a given year that were supplied by AID. The World Fertility Survey and similar studies provide reasonable estimates of contraceptive prevalence by method for most of the countries. These figures are the basis for estimating the amount of contraceptive commodities used in particular countries. The annual shipments of contraceptives provide data on AID-supplied commodities. However, these shipments include supplies to be held in inventory and are based on very rough forecasts of future use. These forecasts are typically premised on the principle of "planning for success," which means that AID field staff, developing country program managers and others involved in the procurement process are encouraged to order ample supplies to cover rapid growth in contraceptive demand.[11] Our analysis assumed that commodities were intended for use in the same year they were shipped by AID. This is clearly not always the case, but other assumptions do not seem more appropriate given that it is impossible to calculate how much of the supplies shipped in a given year were used in that year. Moreover, since AID aims to provide a regular flow of commodities to countries, our assumption provides a reasonable basis for estimating future needs.

It is worth noting, however, that the data needed to construct even simple measures of past trends and future prospects in country-specific commodity supplies have not been easily available to researchers nor, we believe, to the staff of donor agencies themselves. For example, a recent paper by Duff Gillespie, director of the AID Office of Population, and colleagues relies on regional, not country-specific data, and, therefore, does not provide an ideal basis for programmatic decision-making.[12]

Results

Table 2 shows the estimated level of contraceptive use in units of pills, IUDs and condoms in 1985 and the levels projected for the year 2000, by region and country. The estimates for the year 2000 were obtained by applying the Bongaarts target-setting model to developing countries receiving commodities from AID in 1985 and summing the results by region. The table also shows the amount and type of contraceptive commodities supplied by AID in 1985.

The Bongaarts target-setting model provides data on the number of users of specified methods required to reach a targeted fertility level. We estimated the contraceptives these users would need by assuming that each pill user would require 13 cycles per year and each condom user would require 100 condoms per year. The annual number of IUD insertions depends on country-specific continuation rates, which we assumed to be 60 percent at the end of one year. There is doubtless a fair amount of country-specific variation in these rates, but data on contraceptive continuation for all the countries in this analysis are impossible to obtain.

Our results are also influenced by the model's assumptions. Bongaarts' own work assumes 144 condoms per couple-year of protection. We believe this estimate to be high. In Indonesia and Pakistan, and probably other places as well, 60–70 condoms may be a reasonable estimate of what is needed to protect a couple for one year.[13] If users needed 144 condoms per year, the apparent excess of condoms that AID supplied to Africa in 1985, as shown in Table 2, would be much lower. Similarly, if we reduced the one-year IUD continuation rate from the estimate of 60 percent to 50 percent, the excess supply would diminish.

Changing the assumptions about the amount of contraceptive commodities needed in 1985 also influences the projections for the year 2000. Increasing the estimate of condoms used in Asia in 1985 (to 144 per couple per year, for example, based on Bongaarts' assumption) would increase the estimate of the condoms needed in Asia in the year 2000 by over 100 percent. More IUDs, of course, would also be needed if we reduced the estimated continuation rate.

The largest increases in contraceptive prevalence are projected to occur in Africa where pill needs, for example, will increase fourfold—from 47 million cycles in 1985 to 199 million cycles in the year 2000—and where condom needs will increase over five and a half times the 1985 level. The growth in the population of married women of reproductive age and increases in contraceptive prevalence will combine to increase the need for contraceptive commodities elsewhere as well. In Asia, the demand for pills will go from 43 million cycles in 1985 to 128 million cycles by 2000; IUD use will rise from 286,000 units to almost 1.4 million units. In Latin America, the need for pills is projected to increase from 122 million cycles to 218 million cycles over the same period. The need for IUDs and condoms would also increase in Latin America, but not by as much as in other regions.

Country-specific data on contraceptive commodities supplied by AID in 1985 show wide fluctuations by method. These same fluctuations occur by year (not shown) and explain why some countries one would expect to see on a list of recipients of AID commodities are not always there. Indonesia, for example, is not on this list because it did not receive any commodities in 1985. Indonesia received 100,000 IUDs in 1986, but no other commodities were provided in 1984, 1985 or 1986. Mexico, on the other hand, received commodities in 1985, but received no commodities in 1984.

Whatever countries or years are selected for illustration, comparing the estimates of contraceptives used in 1985 with the figures for contraceptives supplied by AID in that year indicates a pattern of over-ordering. This is a result, in part, of AID's "planning for success" strategy and of the need to keep a supply of commodities in inventory. This latter factor may be particularly significant in countries without adequate logistics systems. Program managers, concerned about their ability to meet the needs of clients, may find that keeping a large supply of contraceptives in inventory is the easiest way to overcome the deficiencies in local systems for controlling, storing and transporting contraceptives.[14] The Bangladesh "condom gap"—the difference between the reported prevalence of condom use and the number of donor-supplied condoms sold or distributed—is one well-known example of the difficulties of reconciling data on contraceptive use with commodities supplied by donors.[15]

The problem of over-ordering may mean that AID meets a smaller share of world need than a direct comparison of contraceptives used with those supplied in a particular year might suggest. Such a comparison indicates that in 1985, AID supplied 52 million cycles of pills, enough to meet 46 percent of the need in Africa, 32 percent in Asia and 14 percent in Latin America. AID supplied 600 million condoms, representing 149 percent of the need in Africa, 67 percent of the need in Asia and 89 percent of the need in Latin America. AID also provided approximately 3.8 million IUDs, enough for 245 percent of the need in Africa, 586 percent of need in Asia and 419 percent of the need in Latin America.

Table 2. Estimates (in 000s) of contraceptives used and commodities supplied by AID in 1985 and of projected need in 2000, by country, according to type of contraceptive

Country	1985						2000		
	Estimated use			AID supplied			Projected need		
	Pills	IUDs	Condoms	Pills	IUDs	Condoms	Pills	IUDs	Condoms
Africa	**47,197.8**	**219.4**	**36,784.0**	**21,722.3**	**537.0**	**54,715.0**	**198,902.6**	**1,129.7**	**203,254.0**
Botswana	379.6	2.7	0.0	1,108.8	72.6	678.0	781.3	11.1	0.0
Burkina Faso	96.2	0.3	150.0	116.4	8.0	24.0	1,313.0	2.0	2,110.0
Cameroon	44.2	1.0	340.0	31.2	4.3	21.0	382.2	6.7	294.0
Egypt	16,517.8	91.7	934.0	792.0	16.6	18,288.0	52,562.9	453.7	29,730.0
Ethiopia	1,523.6	2.6	2,440.0	13.9	0.0	0.0	11,424.4	17.0	18,310.0
Gambia	10.4	0.0	20.0	121.2	8.0	102.0	132.6	0.2	210.0
Ghana	898.3	3.7	1,940.0	265.2	0.5	4,350.0	9,865.7	41.9	21,250.0
Kenya	1,495.0	26.4	930.0	76.8	2.8	370.0	5,707.0	151.1	3,560.0
Lesotho	36.4	0.1	20.0	9.6	0.0	0.0	159.9	0.5	110.0
Liberia	31.2	0.1	50.0	68.4	1.2	234.0	560.3	0.8	900.0
Malawi	96.2	0.3	150.0	73.2	0.0	60.0	1,639.3	2.5	2,630.0
Mali	150.8	0.4	240.0	85.2	0.0	270.0	2,086.5	3.1	3,350.0
Mauritius	533.0	0.5	1,070.0	25.2	2.0	0.0	799.5	1.7	1,600.0
Morocco	9,361.3	26.8	3,990.0	6,772.8	50.0	900.0	34,548.8	133.0	14,740.0
Nigeria	8,664.5	10.2	14,140.0	3,109.8	175.7	13,266.0	37,103.3	59.1	60,540.0
Senegal	50.7	0.8	100.0	362.4	1.1	660.0	267.8	4.7	510.0
Sudan	1,671.8	2.4	370.0	138.4	7.0	66.0	16,088.8	16.6	3,590.0
Togo	46.8	0.1	70.0	13.2	2.2	360.0	734.5	1.1	1,180.0
Tunisia	902.2	44.1	2,310.0	200.0	50.0	3,204.0	2,252.9	192.3	5,780.0
Uganda	217.1	0.7	350.0	510.0	2.4	798.0	4,027.4	6.1	6,460.0
Zaire	481.0	1.7	770.0	0.0	100.0	0.0	8,693.1	13.1	13,940.0
Zimbabwe	3,989.7	2.8	6,400.0	7,828.8	32.6	11,064.0	7,771.4	11.1	12,460.0
Asia	**43,069.0**	**286.0**	**715,250.0**	**13,662.0**	**1,676.9**	**480,604.8**	**128,428.3**	**1,363.6**	**1,913,254.0**
Bangladesh	8,183.5	24.6	29,820.0	2,437.2	617.8	234,486.0	37,447.8	138.1	136,450.0
India	0.0	40.0	610,000.0	0.0	800.1	0.0	0.0	150.0	1,450,000.0
Nepal	404.3	0.9	1,150.0	476.4	0.0	8,448.0	2,983.5	5.4	8,530.0
Pakistan	2,215.2	80.0	17,040.0	50.4	252.0	229,056.0	27,056.9	558.6	208,130.0
Philippines	4,330.3	45.4	25,850.0	6,400.8	7.0	4,000.8	11,398.4	199.6	68,040.0
Sri Lanka	994.5	16.2	10,110.0	3,912.0	0.0	3,312.0	1,660.1	55.5	16,860.0
Thailand	21,997.3	74.4	14,930.0	369.6	0.0	1,302.0	34,691.8	237.1	23,550.0
Malaysia	4,943.9	4.5	6,350.0	15.6	0.0	0.0	13,189.8	19.3	1,694.0
Latin America	**121,938.7**	**381.7**	**71,710.0**	**16,632.0**	**1,600.8**	**64,077.2**	**217,982.7**	**1,504.6**	**141,210.0**
Barbados	118.3	0.4	280.0	109.2	3.2	576.0	130.0	1.0	310.0
Bolivia	416.0	10.9	0.0	97.2	20.8	2,136.0	1,056.9	48.5	0.0
Brazil	83,895.5	48.8	33,700.0	81.6	200.0	342.0	133,320.3	162.1	52,550.0
Colombia	10,465.0	74.0	4,240.0	0.0	60.0	24.0	18,662.8	263.7	7,560.0
Costa Rica	950.3	5.6	4,690.0	1,124.4	7.2	1,092.0	1,487.2	18.8	7,340.0
Dom. Rep.	1,151.8	9.6	1,550.0	2,638.8	32.1	7,362.0	2,405.0	35.9	3,250.0
Ecuador	1,748.5	19.9	1,460.0	91.2	15.3	282.0	3,729.7	78.6	3,110.0
El Salvador	902.2	9.5	910.0	516.0	26.0	1,494.0	1,942.2	38.8	1,960.0
Guatemala	903.5	11.2	1,390.0	1,402.0	8.0	3,120.0	2,631.2	54.7	4,050.0
Haiti	234.0	0.6	2,440.0	568.8	0.0	21,498.0	1,084.2	4.2	11,350.0
Honduras	972.4	5.6	2,980.0	649.2	20.0	325.2	2,425.8	25.3	7,440.0
Jamaica	1,158.3	3.1	3,510.0	1,056.0	7.0	4,932.0	2,133.3	11.1	6,460.0
Peru	2,129.4	33.4	3,280.0	734.4	23.3	1,002.0	5,162.3	141.2	7,940.0
Panama	677.3	5.2	1,620.0	810.0	88.0	768.0	1,105.0	16.9	2,630.0
Mexico	16,216.2	143.9	9,660.0	6,752.4	1,090.0	19,124.0	40,706.9	603.8	24,260.0

The growth in AID-supplied commodities may not have to be as large as a simple extrapolation of these percentages into the future would indicate. Table 3 (page 56) shows the projected amount of contraceptives AID would have to ship in the year 2000 to meet the same share of the demand that it did in 1985, but never in excess of the projected need for contraceptives. Even so, 100 percent of the projected need probably overstates AID's proportionate contribution.

Expanded need for AID contraceptive commodities follows the growth in demand caused by increases in population size and in contraceptive prevalence. Major increases will occur in Africa, and important but less substantial growth will

Table 3. Projections (in 000s) of AID-supplied contraceptives in 2000 and percentage change compared with commodities supplied in 1985, by region, according to type of contraceptive

Region	AID-supplied			Percent change		
	Pills	IUDs	Condoms	Pills	IUDs	Condoms
Africa	91,495.3	1,129.7	203,254.0	321.2	110.4	271.5
Asia	40,711.8	1,363.6	1,285,706.6	198.0	−18.7	167.5
Latin America	29,645.6	1,504.6	126,100.5	78.2	−3.8	96.8

take place in Latin America and Asia. AID will have to increase its pill supplies over four times its 1985 level to continue to meet the projected needs in Africa at the same level in the year 2000. AID pill supplies to Asia will have to increase almost threefold and those to Latin America will have to nearly double to keep pace with the estimated demand. Because of the apparent oversupply of IUDs, the future demand for the devices in Asia and Latin America will be less than that supplied in 1985. Additional condoms will be needed for family planning, but the proportionate increases are not quite as large as those projected for the pill. AID would have to almost quadruple its condom supplies to developing countries in Africa, almost triple those to Asia and almost double those to Latin America to maintain current levels. If AID supplies condoms for programs to combat acquired immune deficiency syndrome in developing countries, the increase in supplies needed would be even more dramatic.

The budget increases required for donors such as AID to meet world contraceptive needs in the future as they have in the past will be significant. Not only is the amount of supplies needed increasing, but the costs of contraceptives themselves are also rising. For example, the price AID paid for pills in 1987 increased from 14 cents to 27 cents a cycle.[16] New methods such as NORPLANT® will add to the commodity costs that national family planning programs and donors must pay. The conclusion remains that substantial additional growth in supplies will be required even when over-ordering and a possible decline in the donor's share of world need are taken into account.

Changing the assumptions we used to project future demand for contraceptive commodities would not alter our conclusion significantly. As an illustration, we calculated the difference a substantial increase in the use of sterilization would have on commodity demand. For the eight Asian countries to which AID supplied commodities in 1985, we assumed sterilization acceptance would double or reach a maximum of 50 percent of all users by the year 2000. (This model may also be taken as an estimate of one probable consequence of the introduction of a new highly effective method.) These increases in highly effective contraceptive practice have only modest effects on the estimated need for commodities in Asia: The need for oral contraceptives would decline by 13 percent, the need for IUDs by only five percent and the need for condoms by eight percent. The experience of countries in other regions would differ, of course, but changes in method mix, including increases in modern methods and sterilization, will not solve the contraceptive supply problem. Moreover, any decline in demand for temporary methods resulting from increases in sterilization may be partially offset by the rising cost of contraceptive commodities. Sterilization also has costs that in many cases must be met, at least in part, by local governments or international donors.[17]

Discussion

Because contraceptive users have increased faster than AID's commodity budget, AID funds per contraceptive user have declined since the mid-1970s; unless there are massive increases in appropriations, this decline will continue as the number of users increases. Better planning would help somewhat to make up for decreased funding and clearly should be encouraged. Over-ordering represents a poor use of resources for methods such as condoms, which can deteriorate during storage.[18] More attention should be paid to logistics and the management of contraceptive delivery systems. This is particularly true if one wants to be able to make realistic country-specific projections of commodity needs and their budget implications.

A large increase in funding would still be needed if AID is to continue to supply contraceptives to family planning programs around the world at the same level for the next 15 years. It may be unreasonable to expect AID to do so. Although the American financial commitment is eroding, other countries are increasingly supporting family planning. Questions about how contraceptive commodities will be paid for and what specific arrangements will be made by the international community to cover the increasing demand and cost need to be discussed and addressed now.

The practice of relying on the provision of contraceptive commodities as a major strategy for the promotion of fertility control around the world may also need to be reassessed. However, there is little infrastructure in most developing countries for the manufacture of contraceptives and only a limited market available within most countries to encourage the development of such an infrastructure. It is difficult to conceive of an alternative before the end of the century to the current system, in which international providers have to supply the bulk of the contraceptive commodities needed in the developing world. But while international donors, especially AID, have concentrated on the provision of contraceptive supplies, they have necessarily had to ignore opportunities to provide other types of population-related assistance. One wonders, for example, what would have happened if the capacity to manufacture contraceptives locally had been emphasized instead of supplying foreign-made products.

To some extent, donor-supplied commodities have been indiscriminately distributed within developing countries and, therefore, have competed with potential private-sector ventures in this area. The strategy of providing commodities may have also taken attention away from policy research and development activities that may have done more to increase local and international contributions to family planning than did the provision of commodities.

This said, it is by no means obvious that an alternative strategy would have yielded better results. The infrastructure in the typical developing country was so limited at the time donor programs began that it was probably unrealistic to encourage local manufacture of contraceptives. An unskilled labor force, a dearth of managers, poorly functioning markets and transportation and storage difficulties combined to make local manufacture of contraceptives expensive, if not impossible. The production of oral contraceptives in particular requires high levels of quality control, which requires both large initial capital costs and substantial recurrent costs. Moreover, there are important economies of scale associated with the manufacture

of contraceptives. For many developing countries, the demand is not sufficient to justify investments in local manufacture.

In many of the developing countries, the importation of commodities was an occasion for policy debate and discussion regarding contraceptive distribution programs, tariffs on contraceptives and other health-related products and a host of other family planning issues that would not have been decided if the shipment of contraceptives had not forced the issue. Thus, one can argue that the provision of contraceptives initially encouraged rather than discouraged discussion, formulation and adoption of policies favorable to family planning.

Since the policy of supplying contraceptive commodities to promote fertility control began in the late 1960s, there have been far-reaching changes in developing countries and in the family planning programs that donors aim to assist. The recurrent costs associated with the commodity program have increased, but the proportion of all contraceptive users in developing countries who rely on donor-supplied commodities has declined. Given this, as well as the increase in contraceptive prevalence rates and in the absolute number of people using family planning methods, developing countries themselves will have to play a larger role in helping couples obtain the necessary contraceptive supplies from sources other than international donors.

Some countries may experience significant increases in the proportion of the contraceptive market served by the private sector. Many developing countries are experiencing a growth in income that will enable a larger share of married couples to take advantage of the commercial sector. It is difficult, however, to estimate how much of an increase there will be in the provision of contraceptives by the private sector. Moreover, substantial increases in provision in one country may be offset by a growth in users of public family planning services in another country.

Research on the source of contraceptive supplies presents vexing measurement issues with respect to current levels, and it is even more difficult to develop well-articulated and defensible assumptions with which to project trends. Nevertheless, we need to do a better job of both understanding the characteristics of contraceptive demand and of matching supply to that demand. Moreover, we need country-specific analyses that take account of national demographic and economic circumstances. These will enable managers of development-assistance programs to more effectively target those countries and those users most in need. If donor nations continue to support the provision of contraceptives to family planning programs in developing countries, more sophisticated analysis of the changing method mix and of the impact of new methods, such as NORPLANT, will be needed. (Boonlert Leoprapai offers one such analysis.[19])

It is clear that there is no single simple solution to the problem of providing an adequate supply of contraceptive commodities. Some countries, such as Indonesia, are already manufacturing contraceptives locally and purchasing supplies on the world market. The results of this experience and its implications for other countries moving in this direction need to be examined. (Michael Free and colleagues provide a valuable analysis of some of the factors involved in local production of contraceptives.[20])

An unanticipated consequence of the provision of commodities by international donors—and of the developing countries' acceptance of this policy—may have been that it has lessened the ability of developing countries to meet their own needs. Both donors and the developing countries will have to carefully evaluate and probably significantly change this approach if projected Third World demand is to be met between now and the year 2000. Problems inherent in the current contraceptive commodity programs and policies are real, and they have not been adequately addressed.

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Resumen

El aumento del uso anticonceptivo y de la cantidad de parejas de edad reproductiva han de acrecentar grandemente la demanda de anticonceptivos en el mundo en desarrollo. Se proyecta que los mayores aumentos de la prevalencia de anticonceptivos se produzcan en el Africa, ya que para que el continente logre las tasas globales de fecundidad medias proyectadas por las Naciones Unidas, los suministros de la píldora tendrán que pasar de los 47 millones de ciclos de 1985 a 199 millones para el año 2000. En el Asia, el uso del DIU ascenderá durante ese lapso, de 286.000 unidades a casi

(Continued on page 80)

Dual Fertility Trends in Malaysia's Multiethnic Society

"The striking feature is that while the proportions of Chinese and Indian women who use effective contraceptive methods have increased a great deal over time, the proportion of Malays who do so has dropped."

By Richard Leete

Summary

Between 1957 and 1977, the total fertility rate (TFR) in Peninsular Malaysia fell from 6.2 births per woman to 4.0, with all of the principal ethnic groups (Chinese, Indians and Malays) registering fertility declines. However, in 1988, the TFR among the Chinese and Indians was 2.3 and 2.8 births per woman, respectively, but the rate among the Malays was 4.5 births per woman. The leveling of Malay fertility in the past 10 years is mainly due to a rise in fundamentalist Islamic principles, coupled with pronatalist governmental policies.

Data from the 1984–1985 Malaysian Population and Family Survey indicate that currently married Chinese and Indian women are considerably more likely than Malay women to practice contraception (64 percent and 66 percent vs. 41 percent, respectively). Furthermore, between 1974 and 1985, use of effective contraceptive methods increased among Chinese and Indian women, but declined among Malays; by 1985, a higher proportion of Malay women were using traditional folk methods of contraception than were using the pill, which had previously been the most popular method.

Introduction

During the more than thirty years since 1957, every socioeconomic measure of the welfare and well-being of Malaysia's multiethnic population has changed fundamentally.* There have been spectacular gains in per capita income, reductions in poverty and shifts in employment patterns toward the urban industrial and service sectors.[1] In 1957, just one-quarter of Malaysia's 7.4 million population lived in urban areas, whereas currently, some 40 percent of its 17 million people do so.

Educational opportunities have expanded at all levels. In 1957, four out of every 10 persons aged 10 and over were literate; the corresponding figure 30 years later is eight out of 10, with the illiterate being almost exclusively among the older generations. There have also been marked improvements in public utilities, and most houses now have electricity and piped water.

Socioeconomic changes have been accompanied by sharp reductions in mortality. In 1960, life expectancy at birth was below 60 years, and by 1987, it had risen to around 71 years. Over the same period, the infant mortality rate more than halved, and is currently around 20 deaths per 1,000 live births.

According to demographic transition theory, the socioeconomic and demographic changes that have occurred in Malaysia during the past 30 years should have led to a substantial and sustained fertility decline. Indeed, similar changes elsewhere in East and Southeast Asia—notably, in South Korea, Hong Kong, Thailand, Taiwan and Singapore—have been accompanied by sustained fertility reductions to around replacement level and below.[2] In particular, the transition from high to low fertility in the neighboring multiethnic city-state of Singapore, which attained below replacement fertility in 1975, appeared to foreshadow a similar movement in Malaysia.

Civil registration data showing trends in fertility supported the view, current in the late 1970s and early 1980s, that Malaysian fertility was inexorably heading towards replacement level before the end of the 20th century. As Table 1 shows, in the 20 years from 1957 to 1977, the total fertility rate (TFR) in the Peninsula fell from 6.2 children per woman to 4.0, a reduction of about 35 percent. The rapid socioeconomic changes that were still occurring made continued fertility reductions seem inevitable.

Table 1. Total fertility rates for selected years between 1957 and 1987, by ethnic group, Peninsular Malaysia

Year	All*	Chinese	Indians	Malays
1957	6.2	7.2	6.9	6.1
1960	6.0	6.3	6.7	5.9
1962	6.0	6.2	7.2	5.8
1965	5.5	5.6	6.7	5.5
1967	5.4	5.2	6.2	5.4
1970	4.9	4.6	4.8	5.1
1972	4.7	4.3	4.4	5.0
1975	4.2	3.6	3.9	4.7
1977	4.0	3.4	3.6	4.5
1980	3.9	3.1	3.4	4.5
1982	3.8	2.9	3.2	4.6
1985	3.9	2.7	2.9	4.8
1987	3.5	2.3	2.8	4.5

*Includes births of a very small proportion of women of other ethnic origins.

Note: The figures for 1957 and the early 1960s are subject to a small amount of underregistration, which differs among ethnic groups.

Source: Computed from civil registration data.

The table further shows that from 1957 to 1977, fertility levels declined among each of the three main ethnic groups within Peninsular Malaysia. However, the decline was more spectacular among the Chinese and Indians than among the majority Malays,[3] with their respective fertility reductions over the 20 years amounting to 3.8, 3.3 and 1.6 children per woman. Consequently, whereas Malay fertility had been significantly below that of the Chinese and Indians in 1957 (probably because of the former's longer birth intervals associated with prolonged breastfeeding), by 1977 the pattern had changed so that the TFR among Malay women was one child above

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*Peninsular Malaysia became independent in 1957 and the federation of Malaysia, including Sabah and Sarawak on the island of Borneo, was formed in 1963.

that of the other two communities (4.5 vs. 3.4 and 3.6 children per woman, respectively).[4]

Unlike the situation in Peninsular Malaysia, civil registration of births is only partially complete in the lesser developed regions of Sabah and Sarawak in East Malaysia, which constitute almost 20 percent of Malaysia's population. In these two regions, estimates of fertility levels produced by a range of indirect procedures indicate that fertility declines also occurred among the various ethnic communities, but that the levels were above those of the corresponding communities in the Peninsula.[5]

Since 1977, fertility trends among the Chinese and the Indians have continued sharply downwards, following paths similar to those of the Chinese and the Indians in Singapore and elsewhere in East and Southeast Asia. However, during the same period, fertility among the Malays and other Bumiputera (indigenous groups) has tended to stabilize and even to rise slightly. The net effect has been a significantly smaller reduction in the fertility level of the country as a whole when compared with the previous 10 years. In 1988, the Chinese and Indian communities together accounted for 38 percent of Malaysia's population, compared with 45 percent in 1957; consequently, their influence on overall fertility trends has diminished with time.

This article examines the factors associated with the changes in Chinese and Indian fertility and with the relative stability of Malay fertility over the past decade. The focus is on Peninsular Malaysia because of the greater availability of data for that area of the country. In 1988, the Malays accounted for 57 percent of the Peninsula's population, the Chinese, for 32 percent and the Indians, for 10 percent. The corresponding figures in 1957 had been 50 percent, 37 percent and 10 percent, respectively. The Malays are more concentrated in rural areas and the Chinese in urban areas. As expected, these urban-rural differences are reflected in differing patterns of employment.[6] There is only very limited intermarriage between persons of different ethnic origins in Peninsular Malaysia.[7]

Nuptiality and Childbearing Trends

In countries where first births mainly come after and not before marriage, modern fertility transitions generally follow or are accompanied by changes in nuptiality. Increasing postponement of the age at first marriage generally results from the spread and upgrading of education, coupled with increased employment opportunities in industrial and service occupations after schooling. In Malaysia, marriage marks the beginning of the family formation process, so that falls in the proportion of people married by different ages can have an important influence on family size.

Table 2. Number of women per 1,000 ever-married at selected ages, median age at marriage and average age at marriage of the youngest 25 percent, all by ethnic group and birth cohort, 1984–1985 MPFS

Ethnic group and birth cohort	Age								Median age	Lowest quartile age
	18	20	22	24	26	30	35	40		
Chinese										
1935–1939	162	293	440	566	718	880	922	933	22.2	19.0
1940–1944	161	276	479	617	755	875	921	935	21.8	19.1
1945–1949	118	242	382	539	701	838	892	na	23.1	19.6
1950–1954	84	205	355	554	695	810	na	na	23.0	20.1
1955–1959	57	172	331	511	631	na	na	na	23.4	20.6
1960–1964	76	184	na	na	na	na	na	na	na	20.8
Indians*										
1935–1939	500	648	741	815	852	907	926	926	17.5	15.2
1940–1944	372	582	768	814	861	907	930	954	18.6	16.3
1945–1949	352	507	676	761	845	930	944	na	19.4	16.4
1950–1954	207	378	505	604	703	820	na	na	21.5	17.9
1955–1959	132	306	512	653	694	na	na	na	21.5	18.9
1960–1964	161	232	na	na	na	na	na	na	na	19.7
Malays										
1935–1939	563	754	836	867	890	910	926	926	17.5	14.7
1940–1944	536	717	842	898	926	950	964	971	17.2	15.2
1945–1949	343	508	644	743	839	891	916	na	19.3	16.3
1950–1954	287	449	593	702	800	878	na	na	20.4	17.1
1955–1959	203	345	523	680	768	na	na	na	21.2	18.2
1960–1964	143	292	na	na	na	na	na	na	na	19.0

*The figures for the cohorts of Indian women here and in Table 3 are based on small sample sizes, so they are subject to relatively large margins of error. Note: na=not applicable.

Trends in the first-marriage behavior of successive birth cohorts come from data from the 1984–1985 Malaysian Population and Family Survey (MPFS), which canvassed a representative sample of 4,000 ever-married women aged 15–49 in Peninsular Malaysia.[8] The MPFS was carried out 10 years after the Malaysian Fertility and Family Survey (MFFS), which was part of the World Fertility Survey.[9] Although the core questionnaire in the MPFS was restricted to ever-married women, some information, including date of birth and ethnicity, was also collected about single women in sample households where an eligible respondent was available. By combining the data on single women with those on ever-married women, we can examine marriage profiles of birth cohorts.

Table 2 illustrates the magnitude of the shift in marriage behavior among quinquennial birth cohorts of women in Peninsular Malaysia, and confirms the secular trends found in the 1980 population census of Malaysia.[10] In general, the younger the birth cohort, the lower the proportion ever-married at any given age, irrespective of ethnic group. Almost 20 percent of the Chinese and Indian women in the 1950–1954 birth cohort—a cohort that was moving through the peak childbearing ages from the mid-1970s to the mid-1980s—were still unmarried by age 30. Such large proportions of Chinese and Indian women remaining unmarried at the younger ages is consistent with a reduction in the proportions who will ultimately marry, and also with a substantial depressing effect on the fertility of those cohorts.

Reductions in the proportions of Malay women ever-married at ages 30 and above are less marked than declines among the Chinese and Indians: In the 1950–1954 cohort, only 12 percent of Malay women were not married by age 30. This decline in marriage rates among younger women has been due to later marriage rather than to any significant flight from marriage. Nevertheless, although later marriage among Malays is consistent with reductions in fertility at the younger childbearing ages and with a concomitant later mean age at first birth,[11] there remains considerable latitude for further increases in the age at first marriage among this group of women.

Trends in the median ages at first marriage of the different cohorts and in the

Table 3. Mean number of children ever-born, by duration of marriage, and percentage of childless women after five years of marriage, all according to ethnic group and marriage cohort, Peninsular Malaysia, 1984–1985 MPFS

Ethnic group and marriage cohort	Duration of marriage (years)								% childless*
	2	5	8	10	12	15	20	25	
Chinese									
1950–1954	0.8	2.5	3.9	4.6	5.3	6.2	6.8	7.0	3
1955–1959	0.9	2.5	3.8	4.4	4.9	5.5	6.0	6.3	2
1960–1964	0.9	2.4	3.4	4.0	4.3	4.5	4.8	na	2
1965–1969	1.0	2.3	3.3	3.7	3.9	4.2	na	na	1
1970–1974	1.0	2.1	2.8	3.2	na	na	na	na	2
1975–1979	1.0	2.0	na	na	na	na	na	na	2
Indians									
1950–1954	0.6	2.0	3.3	4.1	4.8	5.7	6.3	6.3	11
1955–1959	1.0	2.3	3.4	4.0	4.5	5.0	5.3	5.3	3
1960–1964	0.8	2.3	3.3	3.9	4.5	5.0	5.2	na	8
1965–1969	0.9	2.2	3.1	3.6	4.0	4.4	na	na	4
1970–1974	0.8	1.9	2.9	3.3	na	na	na	na	6
1975–1979	0.9	2.1	na	na	na	na	na	na	2
Malays									
1950–1954	0.5	1.9	3.2	4.0	4.7	5.7	7.3	8.3	4
1955–1959	0.7	2.0	3.1	3.8	4.5	5.3	6.3	6.8	4
1960–1964	0.8	2.1	3.1	3.6	4.1	4.8	5.7	na	1
1965–1969	0.8	1.9	2.8	3.3	3.8	4.5	na	na	2
1970–1974	0.8	1.9	2.8	3.3	na	na	na	na	3
1975–1979	0.9	2.0	na	na	na	na	na	na	1

*Childless after five years of marriage. Note: na=not applicable.

lower age quartile, shown in the last two columns of the table, highlight the trend toward ever later marriage.

Table 3 shows that ever later age at first marriage has not been accompanied by a postponement of childbearing within the first couple of years of marriage. If anything, there has been a slight increase over time in achieved fertility within the first two years of marriage. Because they are postponing marriage, women in the more recent marriage cohorts are older at the time of their first birth than are those in the earlier cohorts; however, they are also having their first birth at shorter intervals after marriage.[12]

However, the more recent marriage cohorts of Chinese women, and to a lesser extent those of Indian women, are increasingly resorting to family planning after the early years of marriage. For example, Chinese women who first married in the 1970s had about half a child less within the first five years of marriage than did those who first married in the 1950s and 1960s (2.0 children vs. 2.5 children, respectively); reductions in the number of births per woman have been much more dramatic at the longer durations of marriage. Conversely, among Malay women, the intensity of childbearing within the first 10 years of marriage has not changed markedly with time; however, at the longer durations of marriage—15 or more years—there is clear evidence of a big drop in Malay fertility.

While the 1984–1985 MPFS data throw light on secular fertility trends of marriage cohorts in Peninsular Malaysia, they are inadequate for explaining period fertility trends since the 1970s. That is, given the sample size and other technical biases, it is not feasible to rearrange the retrospective data from the survey in order to obtain single calendar-year measures by ethnic group. However, recent trends can be strikingly captured using civil registration data. A convenient way of assessing trends is to disaggregate TFRs according to birth order. These rates are computed in exactly the same manner as are period TFRS, except that the numerators of the age-specific rates are restricted to births of a given order.

Among Chinese and Indian women, fertility rates have declined dramatically for four or more lifetime births, as Table 4 shows, and fertility rates have also declined for three lifetime births. For example, whereas in 1970, births of the fourth order and above made up more than half of the Chinese TFR, by 1987, such births accounted for less than one-quarter of it. Large families are a phenomenon of the past for these communities, and progression toward a two-child family norm is increasingly evident.

In the future, Chinese and Indian couples are likely to have even smaller families than those suggested by their 1987 TFRs, which were 2.3 and 2.8 children per woman, respectively. Evidence for this comes from a regression analysis of trends in Chinese and Indian TFRs between 1970 and 1985 computed from civil registration data in the different states and regions of Malaysia* and in other selected countries in East and Southeast Asia.[13] The results indicate that despite significant differences in intercept values, which reflect wide geographic variations in fertility levels, there are striking similarities in slope values, which reflect similar paths of decline. The analysis suggests that further declines in Chinese fertility are likely because of the probability of further reductions in the lag fertility states—such as Sabah, Sarawak and Johore—as they continue the catching-up process, and in the lead fertility areas—such as the West coast states of Penang and Selangor—as they follow the fertility trends of other overseas Chinese populations. Indian fertility in the higher fertility states could also follow a similar trend to that of the Indians in the lead state of Penang and in Singapore.

On the other hand, among the Malays, third- and fourth-order fertility rates have hardly changed since 1970, and reductions in fifth-order rates have been relatively modest. The only significant downward trend is in births of the sixth order and above, which generally occur to women of older childbearing ages and of longer durations of marriage.

Period fertility indicators, such as those shown in Tables 1 and 4, can sometimes give an exaggerated picture of underlying trends. For example, during the transition to older ages at marriage, lower fertility rates at a given birth order among younger women may be made up in subsequent years as the women age. This situation appears to have occurred among the Malays. Period fertility in the first half of the 1970s fell below that of the late 1960s mainly due to declines in fertility rates among women under the age of 25, coupled with declines in births at orders six and above; the former represented postponement of births due to later marriage, and the latter represented the trend

*Peninsular Malaysia is composed of 11 states and the Federal Territory of Kuala Lumpur. The regions of Sabah, including the Federal Territory of Labuan, and Sarawak are also sometimes referred to as states.

toward a family-size norm of between four and five children.[14] A part of the boost in Malay period fertility in the late 1970s and early 1980s resulted from the making-up of postponed births.

An analysis of Malay fertility trends computed from civil registration data in the different states of Malaysia showed that when fertility levels began to stabilize in the mid-1970s and subsequently increased slightly, the response was fairly uniform in the different states, despite significant differences in prevailing fertility levels and in socioeconomic development.[15] However, there are distinctive regional fertility patterns, and the differences are particularly evident between the lesser developed East coast states and the more prosperous West coast states.

Malay fertility has tended to be lower in the more multiethnic and more urbanized West coast states of Penang and Selangor than it has in the rural and poorer East coast states of Kelantan and Trengganu. However, fertility in Penang and Selangor rose in the early 1980s, so that in 1987, it was at the same level or higher than it had been 10 years earlier. The short-term impact of modernization and development on Malay fertility in these states during this period appears to have been negligible. The Malays in Penang may not be a reliable lead group for assessing what might follow elsewhere in the Peninsula, because Penang is the only state where the Malays do not constitute the majority of the population. Interestingly, in the southern state of Johore, which borders Singapore and has benefited from considerable industrialization, the TFR has fallen below that in Selangor (4.3 vs. 4.6 children per woman, respectively).

Despite considerable advances in socioeconomic development and improvements in individual welfare in the East coast states of Kelantan and Trengganu, fertility levels remained relatively stable there throughout 1970–1987. Malay women in these two states have 5–6 children, on average. Further, there is relatively little variation in fertility levels in the 15 different administrative districts in these two states.[16]

Regional differences in Malay fertility levels are partly, but not entirely, explained by differences in marriage patterns and in the use of family planning. Women living in the east coast states tend to marry for the first time at a considerably younger age than do their counterparts elsewhere in the Peninsula, and they are also much less likely to use birth control, particularly the effective methods.[17]

Table 4. Total fertility rate and birth-order fertility rate, by ethnic group and year, Peninsular Malaysia

Ethnic group and year	TFR	Birth order					
		1st	2nd	3rd	4th	5th	≥6th
Chinese							
1970	4.62	0.84	0.75	0.69	0.57	0.45	1.33
1974	3.90	0.95	0.73	0.61	0.47	0.34	0.81
1978	3.37	0.91	0.80	0.60	0.41	0.25	0.40
1982	2.93	0.84	0.77	0.59	0.35	0.18	0.20
1987	2.25	0.63	0.61	0.47	0.29	0.13	0.11
Indians							
1970	4.80	0.74	0.69	0.64	0.57	0.50	1.65
1974	4.16	0.81	0.73	0.64	0.50	0.43	1.05
1978	3.48	0.85	0.74	0.62	0.44	0.30	0.54
1982	3.18	0.80	0.73	0.60	0.41	0.26	0.37
1987	2.77	0.76	0.63	0.51	0.36	0.23	0.28
Malays							
1970	5.09	0.80	0.78	0.73	0.66	0.60	1.53
1974	4.73	0.87	0.77	0.67	0.58	0.51	1.34
1978	4.28	0.84	0.78	0.66	0.52	0.41	1.06
1982	4.59	0.87	0.82	0.75	0.61	0.47	1.07
1987	4.51	0.84	0.77	0.73	0.65	0.49	1.03

Source: Computed from civil registration data.

Family Planning

The Malaysian National Family Planning Programme was launched in the mid-1960s following concern over high rates of population growth against a background of falling per capita income and considerable unemployment. The First Malaysia Plan (1966–1970), called for less rapid population growth[18] and established the National Family Planning Board (NFPB) to carry out government population policy.

The family planning program began in the large metropolitan centers in 1967–1968 and was gradually extended to smaller towns and adjoining rural health centers. In the early 1970s, the program was integrated with maternal and child health services in the rural areas and was then expanded to cover remote rural areas through the use of mobile units and traditional birth attendants. Currently, contraceptive service delivery in urban areas is provided by NFPB clinics, the Family Planning Associations and private practitioners. Services in the rural areas are mainly covered by the Ministry of Health.

Table 5 shows trends in knowledge, ever-use and current use of contraceptives among currently married women in Peninsular Malaysia according to data from the 1974 MFFS and the 1984–1985 MPFS. Overall, about one-half of all currently married women were using contraceptives in 1985, compared with just one-third of such women 10 years earlier. Both surveys

Table 5. Percentage of currently married women who had ever heard of, had ever used or were currently using specific contraceptive methods, 1974 MFFS and 1984–1985 MPFS

Method	Knowledge		Ever-use		Current use	
	1974 (N=5,807)	1984–1985 (N=3,888)	1974 (N=5,807)	1984–1985 (N=3,888)	1974 (N=5,807)	1984–1985 (N=3,888)
Any*	**90**	**99**	**50**	**77**	**33**	**51**
Pill	55	97	34	45	19†	12
IUD	39	63	2	5	1	3
Condom	26	75	2	22	†	8
Sterilization	71	85	4	8	4	8
Rhythm	29	58	11	22	4	7
Withdrawal	23	47	8	17	2	4
Abstinence	26	37	5	6	2	2
Folk methods	15	54	6	15	2	8

*Includes a very small number who had ever heard of, had ever used or were currently using injectables.
†In 1974, current users of the pill and condom were grouped together.

reveal that the pill is the most commonly known and most widely used contraceptive method in the Peninsula. In 1985, about 12 percent of currently married women were using the pill, which is the main method of birth control promoted by the family planning program. However, the 1985 data also show that although knowledge of effective contraceptive methods (i.e., the pill, the IUD, condoms and sterilization) is widespread, only about 31 percent of currently married women use them, while 21 percent of such women rely on less effective and traditional methods.

Table 6 shows the level of current contraceptive use among currently married Malay, Chinese and Indian women according to patterns of practice over the 10 years between the two surveys. Overall, currently married Chinese and Indian women are considerably more likely than their Malay counterparts to practice contraception (64 percent and 66 percent vs. 41 percent, respectively). The most popular methods among the Chinese are the condom, the pill and sterilization, used respectively by 17 percent, 13 percent and 13 percent of currently married women. Further, a considerable proportion (11 percent) of Chinese couples use the rhythm method. Among the Indians, sterilization is the dominant method; more than one out of every five married Indian women have been sterilized. However, a substantial proportion of Indians use such ineffective methods as withdrawal and periodic abstinence.

By 1985, traditional folk methods, such as herbal-based *majun* and *jamu*,* had become more popular than oral contraceptives among the Malays. In fact, much of the increase in contraceptive use by the Malays (from 22 percent of currently married women in 1974 to 41 percent in 1985) was due to the increased use of traditional folk methods. On the other hand, sterilization has remained uncommon among the Malays.

Table 7 displays the pattern of contraceptive practice found in 1974 and in 1984–1985 among currently married Malay, Chinese and Indian women according to marriage cohort. It is particularly illuminating to compare use among women from marriage cohorts in 1974 with those in the 1984–1985 survey who married 10 years later, thereby taking duration of marriage into account. Whereas the proportion of women in all three ethnic groups who currently practice contraception increased over the period between the surveys, the gap between the groups is still marked. For example, among the 1955–1959 cohort in the earlier survey, 57 percent of Chinese women, 50 percent of Indian women and 26 percent of Malay women were practicing contraception; comparable figures from the later survey for women married in 1965–1969 were 78 percent, 88 percent and 46 percent, respectively.

The striking feature is that while the proportions of Chinese and Indian women who use effective contraceptive methods have increased a great deal over time, the proportion of Malays who do so has dropped, both among women in the same marriage cohorts and among those who have been married for equivalent durations. Whereas in 1974, 24 percent of Malay women in the 1965–1969 marriage cohort were using effective methods, 10 years later, only 15 percent of such women were doing so. The net result is that the ethnic disparity in the use of modern methods of birth control has widened.

A similar picture emerges when contraceptive use among women in the three ethnic groups is examined according to age-group rather than marriage cohort (not shown). Among both the Chinese and the Indian women, levels of use of effective methods increased for virtually every age-group over the 10-year period between the two surveys; however, among the Malays, levels of use of effective methods declined for every age-group (except 45–49-year-olds), and overall, use of effective methods in 1985 remained below that of the other two ethnic groups in 1974.

The 1984–1985 MPFS asked currently married women under age 35 about their contraceptive behavior during different birth intervals. The behavior of two 10-year marriage cohorts during the first four birth intervals is shown in Table 8. In interpreting the data, it must be kept in mind that they only reflect the contraceptive behavior of those members of the cohorts who had reached each specified interval. For example, not all women in the 1970–1979 marriage cohort who will ultimately have a third or fourth birth had done so by the date of the survey.

The data reveal a substantial increase in the use of birth control during the interval between marriage and first birth, but use during this interval is still quite uncommon. Most Malaysians regard pregnancy as a natural consequence of marriage, and

Table 6. Percentage of currently married women practicing contraception, by method, according to ethnic group, 1974 MFFS and 1984–1985 MPFS

Method	Chinese		Indians		Malays	
	1974 (N=1,988)	1984–1985 (N=1,331)	1974 (N=543)	1984–1985 (N=390)	1974 (N=3,241)	1984–1985 (N=2,116)
All*	48	64	40	66	22	41
Pill	25†	13	14†	6	16†	11
Condom	†	17	†	7	†	2
Sterilization	6	13	13	22	1	2
Other female	2	5	1	4	0	2
Rhythm	7	11	5	5	1	5
Withdrawal	3	4	3	10	1	3
Abstinence	4	2	4	10	0	1
Folk methods	1	0	0	1	3	14

*Includes other methods not listed in the table. †In 1974, the pill and condom were grouped together.

Table 7. Percentage of currently married women practicing contraception and percentage using effective methods, by marriage cohort, according to ethnic group, 1974 MFFS and 1984–1985 MPFS

Cohort	Chinese	Indians	Malays
1974 MFFS			
All methods			
1950–1954	45	54	25
1955–1959	57	50	26
1960–1964	56	56	29
1965–1969	54	37	31
Effective methods			
1950–1954	28	41	18
1955–1959	42	33	20
1960–1964	40	42	23
1965–1969	37	26	24
1984–1985 MPFS			
All methods			
1960–1964	68	88	47
1965–1969	78	88	46
1970–1974	75	78	44
1975–1979	61	63	46
Effective methods			
1960–1964	52	56	16
1965–1969	56	51	15
1970–1974	58	56	19
1975–1979	46	34	20

Majun and jamu are Malaysian herbs which, when taken with water by women, are considered to have a contraceptive effect.

a small proportion, particularly of Chinese couples, start trying to get pregnant before formal marriage.[19] This pattern contrasts with the situation in many Western countries where contraceptive use before and immediately after marriage is widespread. The data also indicate an increase in contraceptive use between births; that is, the proportion of members of the 1970–1979 cohort who practice contraception during given birth intervals is considerably higher than that of members in the 1960–1969 cohort.

Although contraceptive use between births has increased among women in all three ethnic groups, the levels of use differ. At each birth interval, the level of use is generally highest among the Chinese and lowest among the Malays, and the gap between the two groups widens with each successive birth order. Comparison of the ethnic differential between the 1960–1969 and the 1970–1979 cohorts shows that this differential has tended to grow larger.

The Chinese and Indian Transitions

In Malaysia, fertility among the Chinese has fallen very rapidly over the past 20 years and will almost certainly drop to replacement level before the year 2000. It is also likely, but less certain, that Indian fertility will do so, despite pockets of relatively high fertility among poorer Indians who work and live on the rural estates. Demographic transition theory could have predicted the rapid decline of Chinese and Indian fertility. By the mid-1960s, these groups had already met the three preconditions for substantial fertility decline identified by Ansley Coale—namely, that fertility was within the calculus of conscious choice; that reduced fertility was perceived to be advantageous; and that effective techniques of birth control or prevention were available.[20]

Explanations of the Chinese and Indian fertility transitions in Malaysia should be consistent with explanations of comparable transitions that have occurred among the overseas Chinese and Indians elsewhere in East and Southeast Asia. Rising standards of living often beget changes in material aspirations. Among the Chinese and Indians in Malaysia, recognition of the economic advantages of smaller families probably propelled fertility declines and became ever more evident as socioeconomic development accelerated.

The existence of readily available contraceptive methods was instrumental in helping Chinese and Indian couples control their reproduction. The religious prescriptions of these communities—most Chinese are Buddhists, and most Indians are Hindu—do not constrain the practice of birth control for limiting family size. The MPFS data show that ever-use of birth control is now virtually universal for these groups.[21] Of course, when socioeconomic conditions and motivation favor limiting family size, and when the means for doing so are readily available, ever-use of birth control is likely to be universal. However, there is still considerable scope for increased use of effective contraceptives by Chinese and Indians who currently practice contraception, particularly by Indians. It is probable that substantial proportions of women in these two communities, particularly the Chinese, resort to induced abortion to avoid unwanted births.

The spread and upgrading of education in Malaysia and elsewhere in East and Southeast Asia were the likely catalysts for change in the demographic behavior of the Chinese (and to a somewhat lesser extent that of the Indians). Education brought about a later age at marriage and heightened perceptions about the opportunity costs of early marriage and childbearing, particularly with respect to paid employment. The modern industrial and service sectors have expanded rapidly over the past two decades and have created a big manpower demand. Further, education increased couples' ability to understand the importance of practicing family planning effectively and of avoiding unwanted births. Finally, it increased awareness of the importance of acquiring skills for upward social and economic mobility.

Leveling of Malay Fertility

The leveling of Malay fertility over the past 10 years or so should be viewed within the context of longer term trends. It occurred after a significant fall in period fertility between 1957 and 1977, which had resulted from a trend toward an ever later age at first marriage. The later age at marriage led to a later age pattern of childbearing and was coupled with reductions in marital fertility at the longer durations of marriage among women of older childbearing ages and higher parity (implicitly shown in Table 3). Assessments of the leveling also need to take into account the temporary boost to period fertility indicators that resulted from making up for missed births by cohorts of women who married later; these women entered the prime childbearing ages and gave birth in the mid-1970s and early 1980s.[22]

But why has Malay fertility apparently stabilized at around 4.5 births per woman rather than followed the rapid downward trend of Chinese and Indian fertility? One obvious factor is that because the Malays are more agrarian, they have not been subject to modernization forces to the same extent as have the other two communities in Peninsular Malaysia. The more rural lifestyle of the Malays, coupled with support from extended family members, lessens the economic costs of bearing and caring for children. However, these factors alone do not adequately explain the leveling of fertility, given the spread of education and economic and other welfare gains that have occurred among the Malay community.

Table 8. Percentage of currently married women using contraceptives, by birth interval, according to marriage cohort and ethnic group

Cohort and ethnic group	Marriage to 1st birth	1st to 2nd birth	2nd to 3rd birth	3rd to 4th birth
1960–1969				
Chinese	1	38	59	47
Indians	1	28	36	35
Malays	2	30	37	37
1970–1979				
Chinese	11	55	69	66
Indians	7	46	59	64
Malays	4	47	54	53

Fertility trends among the Malays have not simply followed the so-called "logic of socioeconomic development and the momentum of demographic transition."[23] Explanations of their fertility changes, or the lack of them, are more complex. It is possible that value systems that are less susceptible to the prevention of births or to the spread of modern birth control methods have had as great an impact on Malay fertility as have the previously noted factors. The Malays adhere to the Islamic faith, and there has been a movement towards fundamentalism among some sections of that community since the mid-1970s. The spread of fundamentalism has had an impact on behavior. For example, among the more educated Malays, the rise of fundamentalism has affected perceptions about the role of women as well as the actual social behavior of women, particularly in rural areas.

The effects of the fundamentalist movement on Malay fertility are difficult to pinpoint; however, they have probably been largely responsible for the decline in the use of modern contraceptive methods and the rise in the use of traditional methods. Some sections of the Muslim community

in neighboring southern Thailand have expressed opposition to the use of modern methods of birth control on religious grounds.[24] Fertility levels of the Thai Muslim minority are significantly higher than those of the Buddhist majority.

Although some predominantly Muslim countries, such as Indonesia, have experienced substantial fertility declines, the declines have occurred where there has been strong government backing for national family planning programs. Substantial fertility declines have also occurred among the Malays in neighboring Singapore.[25] However, the socioeconomic and political climate in Singapore, as well as its population policy, are quite different from that faced by the Malays in Malaysia.

There has also been widespread dissemination of the idea that resource-rich Malaysia with its relatively low population density is underpopulated. That idea was expressed by the government in early 1982 when it announced a New Population Policy with a target of 70 million inhabitants to be attained by the year 2100.[26] Following the announcement of the new policy, the government's message was widely disseminated in the media and measures such as income tax relief were introduced to encourage childbearing. The shift in government population policy occurred against a background of manpower shortages that arose in the late 1970s and early 1980s as the economy grew rapidly. Some economic planners considered that a larger population would create a larger domestic market to support and sustain industrial growth, which, in turn, would help reduce Malaysia's dependence on export-oriented industries.

With the change in population policy from antinatalism to pronatalism, the National Population and Family Planning Board was renamed the National Population and Family Development Board, and more emphasis was placed on its role in promoting family welfare and development. There had already been a steady fall in the number of new acceptors to the national family planning program in the late 1970s, but the fall was substantially greater following the announcement of the new population policy.[27] The publicity surrounding the announcement probably also contributed to the upward revision in birth expectations. The 1984–1985 MPFS found that Malays were more responsive to the government's New Population Policy than were the other ethnic groups.[28] In response to a question about their reaction to the new policy, a significant fraction of the sample of Malay women stated that they had revised their family size expectations upwards as a direct consequence of the government's message.

Table 9. Among currently married women, average number of children born and average expected, by marriage cohort, according to ethnic group, 1974 and 1984–1985

Marriage cohort	Chinese		Indians		Malays	
	1974	1984–1985	1974	1984–1985	1974	1984–1985
Children born						
1960–1964	4.2	4.9	4.6	5.4	4.0	5.8
1965–1969	3.0	4.2	3.0	4.6	2.6	4.9
1970–1974	1.1	3.5	1.1	3.8	1.0	3.8
1975–1979	na	2.6	na	2.8	na	2.7
1980–1984	na	1.1	na	1.0	na	1.1
Children expected						
1960–1964	4.6	5.0	5.0	5.5	5.2	6.6
1965–1969	4.0	4.4	3.9	4.9	4.5	6.1
1970–1974	3.5	3.9	3.1	4.1	3.9	5.7
1975–1979	na	3.5	na	3.7	na	5.1
1980–1984	na	3.2	na	3.1	na	4.9

Note: na=not applicable.

A comparison of birth expectation data for the same marriage cohorts in the 1984–1985 MPFS and the 1974 MFFS, shown in Table 9, indicates that for the 1970–1974 cohort of Malay women—the youngest for whom information is available in both surveys—there was an upward revision of almost two children in expected family size, from 3.9 in 1974 to 5.7 in 1984–1985. In fact, by 1984–1985, that cohort had almost achieved its expected family size as stated 10 years earlier. Even among Malays who first married in 1980–1984, expected family size is almost five children. There was also an upward revision in birth expectations among the Chinese and the Indians, albeit less marked and targeted at lower levels.

Of course, family size expectations can and do change rapidly, and they may not give a reliable indication of future behavior. The official population projections assume a modest decline in Malay fertility over the coming decade toward a family size of around four children per woman.[29] It is inconceivable that fertility will rise to levels that prevailed in the 1960s and before. Similarly, it is unlikely that fertility will decline substantially in the coming decade, despite the increase in the proportion of educated women of childbearing age and the fact that rates of urbanization among the Malays continue to increase (from just one in 10 in urban areas in 1957 to one in three in 1987).

Gay Ness and Hirofumi Ando have argued that it is prudent to take cognizance of political and organizational factors related to strengths and weaknesses of family planning programs.[30] In the Malaysian context, political and religious factors are closely interrelated. For example, the majority political party in the ruling national coalition, the United Malay National Organization, represents the interests of the Malays, and Islam is the official religion as enshrined in the national constitution. The principal Malay opposition party, Parti Islam Malaysia, which is strongest in the East coast states, bases its manifesto on fundamentalist Islamic principles. Both political and religious factors appear to have played a central role in the recent leveling of Malay fertility in Malaysia. Such factors are not taken into account in demographic transition theory. While that theory provides a useful perspective for assessing Chinese and Indian fertility trends in Malaysia, it has clear limitations for explaining recent fertility trends among the Malays.

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Resumen

En la Malasia peninsular, la tasa global de fecundidad (TGF) disminuyó entre 1957 y 1977 de 6,2 hijos a 4,0 hijos por mujer, registrándose bajas en todos los grupos étnicos principales (chinos, indios y malayos). En 1988, sin embargo, la TGF de chinas e indias era, respectivamente, de 2,3 y 2,8 hijos por mujer, pero de 4,5 para las malayas. La estabilización de la fecundidad entre éstas últimas durante los últimos 10 años obedece, ante todo, al auge de los principios islámicos fundamentalistas y a una política oficial pronatalista.

Los datos de la Encuesta Demográfica y Familiar Malaya de 1984–1985 indican que las casadas de origen chino e indio son considerablemente más proponsas que las malayas a practicar la anticoncepción (64 por ciento y 66 por ciento contra 41 por ciento, respectivamente). Además, de 1974 a 1985, el uso de métodos anticonceptivos eficaces aumentó entre chinas e indias, pero decreció entre las malayas. Hacia 1985, el porcentaje de malayas que recurrían a métodos populares tradicionales era superior al de usuarias de la píldora, que había sido hasta entonces el método más difundido.

Résumé

Dans la péninsule malaisienne, l'indice synthétique de fécondité a diminué entre 1957 et 1977 de 6,2 à 4,0 enfants par femme, cette baisse ayant touché tous les principaux groupes ethniques (chinois, indiens et malais). En 1988, cependant, l'indice synthétique de fécondité des Chinoises et des Indiennes était, respectivement, de 2,3 et 2,8 enfants par femme, mais de 4,5 enfants chez les Malaisiennes. Parmi celles-ci, la stagnation plus récente de la fécondité en Malaisie provient, en grande partie, d'un renouveau du mouvement fondamentaliste islamique, et d'une politique gouvernementale pro-nataliste.

Les données de l'Enquête malaisienne démographique et de la famille réalisée entre 1984 et 1985, indiquent que les femmes mariées d'origine chinoise ou indienne sont considérablement plus susceptibles d'utiliser un moyen contraceptif que les femmes d'origine malaisienne (64 et 66 pour cent contre 41 pour cent, respectivement). D'autre part, entre 1974 et 1985, l'utilisation des méthodes efficaces a augmenté parmi les Chinoises et les Indiennes, mais a baissé parmi les Malaisiennes. En 1985, le pourcentage de Malaisiennes qui recouraient aux méthodes traditionnelles dépassait celui des usagères de la pilule, auparavant la méthode anticonceptionnelle la plus populaire.

The Effect of Counseling on Sterilization Acceptance by High-Parity Women in Nigeria

"A sterilization rate of 13 percent among high-parity women . . . may not seem impressive when compared to the worldwide prevalence of voluntary female sterilization. However, it is notable among Nigerian women. . . . "

By Alexander E. Omu, Sharon S. Weir, Barbara Janowitz, Deborah L. Covington, Peter R. Lamptey and Nadine N. Burton

Summary

To inform women of the risks associated with high parity and to increase understanding of birth control methods, especially voluntary surgical contraception, the University of Benin Teaching Hospital launched a family planning and education program for pregnant women who had had four or more previous deliveries. More than 1,000 high-parity women admitted for prenatal care during a 19-month period were randomly allocated either to a treatment group exposed to four individualized counseling sessions on family planning methods and the health risks associated with high parity or to a control group that received only the standard family planning information provided at the prenatal clinic.

Overall, 71 percent of the women in the treatment group were using an effective method of birth control at six weeks postpartum, compared with 51 percent of the women in the control group. About 40 percent of women in both groups had indicated at admission that they did not want more children, but women in the treatment group were significantly more likely to choose female sterilization as their postpartum contraceptive method than women in the control group—13 percent, compared with three percent. By age, the proportions sterilized in the treatment group ranged from four percent of those younger than 30 to 28 percent of those 35 and older; comparable proportions for the control group were two percent and nine percent, respectively. Six percent of women in the treatment group who had four living children underwent sterilization, compared with 46 percent of those with seven or more living children. Among control patients, the proportions were zero and five percent, respectively.

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Background

During pregnancy, women older than 35 and women who have had four or more children are at increased risk of hemorrhage and high blood pressure, two of the most common causes of maternal death in developing countries.[1] Because women in the developing world often start to have children in their late teens or early twenties and do not practice family planning to space their pregnancies, women often achieve high parity at a comparatively young age and are thus exposed to the dangers of high-risk pregnancies for many years. As a result, most women in regions where the total fertility rate is high face an elevated risk of maternal morbidity and mortality during their later childbearing years. It is, therefore, important for high-parity women to have access to a trouble-free, reliable method of contraception to protect them from potentially dangerous pregnancies.

Voluntary female sterilization is one of the most widely used methods of contraception, especially among women over the age of 35, in every region of the world except Sub-Saharan Africa. Among currently married women aged 35–44 practicing contraception, 43 percent in Asia, 42 percent in Latin America and 25 percent in the Middle East rely on sterilization. In contrast, only eight percent of comparable women in Sub-Saharan Africa have undergone sterilization.[2]

Nigeria has one of the lowest rates of female sterilization in the region: Less than one percent of older women practicing contraception are sterilized.[3] In part, this is because Nigerian family planning programs are new. Until recently, there was little demand for family planning programs as a result of the widespread traditional desire for large families. A majority of Nigerian women want another child immediately after or within a year of delivering their last baby.[4] The 1981–1982 Nigeria World Fertility Survey found that urban women aged 35–44 with four or more children still wanted an average of two more children; the total fertility rate in Nigeria was 6.3.[5]

Extended breastfeeding and postpartum abstinence have traditionally provided for birthspacing and protected Nigerian women from some high-risk pregnancies, but rapid urbanization and other social changes are fast eroding these traditional practices. Yet, public knowledge and utilization of family planning methods, especially sterilization, are still very low. Only 32 percent of Nigerian women aged 15–44 know of any method of contraception, modern or traditional. Furthermore, just seven percent have heard of voluntary surgical contraception.[6]

By contrast, in Kenya, Senegal and Zimbabwe—African countries with comparatively more exposure to family planning programs—at least 45 percent of women 15–44 know of female sterilization.[7] In those countries, family planning utilization is growing at a faster pace, reflecting the increased availability of services and of information and education programs.

According to a 1980 survey of women delivering at three hospitals in Benin, Nigeria, major reasons for not using contraception were spousal opposition, religious

values and fear of side effects.[8] Another study, at the University of Benin Teaching Hospital, found that women who had had more than four deliveries represented 20 percent of maternity patients but accounted for 55 percent of maternal deaths at the hospital.[9] On the basis of these studies and his own research and clinical experience in obstetrics and gynecology, the senior author of this article decided to launch a project in collaboration with Family Health International that would implement and evaluate a family planning information and education program for high-parity women. The program would attempt to inform these women of the dangers associated with multiple pregnancies and of the availability, safety and effectiveness of all methods of contraception. It would also stress the appropriateness of voluntary surgical contraception for high-parity women.

The setting for the project was University of Benin Teaching Hospital, a 450-bed referral hospital that serves a catchment area of approximately four million inhabitants. About 4,000 deliveries per year occur at the hospital; a 1981 obstetric surveillance study found that one-third of the deliveries were for a fourth-order birth or higher.[10]

The project's goal was to demonstrate that taking the time to educate and inform women at risk of pregnancy complications because of high parity would increase the acceptability of postpartum family planning in a population otherwise reluctant to accept any method of contraception, especially surgical methods. Guidelines for the program were based on the premise that counseling must elicit an informed and free choice. The counselors' responsibility was threefold: They were to assess the readiness of the woman to end her fertility, provide complete information to the patient about the risk associated with surgical contraception and inform her of the availability of reversible methods. Women included in the study received no inducement to participate. Those who selected sterilization went through a careful informed-consent procedure that included information about the permanence of the method, ample time to reflect on their decision without external pressures and a witnessed signature.

The objectives of the evaluation component were to determine whether the program affected the demand for voluntary surgical contraception among high-parity women delivering at the University of Benin Teaching Hospital, whether counseling improved the understanding of and attitudes toward sterilization among these women, and whether the information and education increased the postpartum demand for all family planning methods by high-risk women.

Methods

In this study, a high-parity woman was defined as one who had had four or more previous deliveries and was at or beyond the 28th week of gestation. All high-parity women who were scheduled to deliver at the hospital and who had attended its prenatal clinic during a 19-month period were included in the study, except women for whom a physician had recommended sterilization for medical reasons. The study ran from September 1984 through March 1986.

By a random allocation process, high-parity women were assigned to one of two groups at the time of their initial visit to the prenatal clinic. One group became the treatment group and was exposed to an information and education program that included individualized counseling on family planning and the health risks associated with high parity. The second group became the control group.

Women in the treatment group were to receive information four times: at admission to the study (during the 29th to 35th weeks of gestation), during a prenatal visit after the 36th week of pregnancy, during hospitalization for delivery and at six weeks postpartum. Nurses conducted the first and third counseling sessions; physicians did the second and fourth. They were trained for the counseling by staff members from Family Health International according to a protocol developed with the Association for Voluntary Surgical Contraception and using materials provided by that organization.

The protocol called for the treatment group to receive information on the health effects of high parity and the benefits of family planning at the first, third and fourth sessions. Education regarding all methods of contraception was scheduled for the second and third sessions. Voluntary surgical contraception was presented in some detail, and the advantages and limitations of the method were discussed in the context of high-risk pregnancies. Those who expressed interest in sterilization received more in-depth counseling at the second, third and fourth sessions to ensure that they fully understood the permanence of the method and potential complications associated with the surgical procedure.

The control group received only the

Table 1. Percentage distribution of high-parity women at the University of Benin Teaching Hospital, by study group, according to various characteristics, Nigeria, 1984–1986

Characteristics	All women (N=1,012)	Treatment group (N=509)	Control group (N=503)
Age			
20–24	4.5	5.7	3.4
25–29	30.3	28.3	32.4
30–34	37.8	39.9	35.8
35–39	21.3	21.6	21.1
≥40	5.0	4.1	6.0
Unknown	0.9	0.4	1.4
Ethnicity			
Edo	53.3	51.9	54.7
Ibo	14.6	14.3	14.9
Ishan	10.4	11.2	9.5
Other	21.5	22.2	20.9
Unknown	0.2	0.4	0.0
Education			
None	16.4	17.3	15.5
Primary	52.4	49.9	54.9
Secondary	17.0	17.5	16.5
Postsecondary	14.1	15.1	13.1
Unknown	0.1	0.2	0.0
Religion			
Protestant	42.5	45.0	40.0
Catholic	27.2	26.9	27.4
Traditional	24.5	22.4	26.6
Other	5.2	5.1	5.4
Unknown	0.6	0.6	0.6
Previous deliveries			
4	26.3	26.9	25.6
5	30.3	28.9	31.8
6	21.9	24.8	19.1
≥7	21.3	19.3	23.5
Unknown	0.1	0.2	0.0
Living children			
0–3	9.6	9.2	9.9
4	32.9	34.0	31.8
5	30.3	29.3	31.4
6	16.1	17.9	14.3
≥7	11.0	9.4	12.5
Unknown	0.1	0.2	0.0
Infant deaths			
0	70.3	70.5	70.0
1	22.5	23.2	21.9
≥2	7.1	6.1	8.2
Unknown	0.1	0.2	0.0
Cesarean sections			
None	92.6	92.1	93.0
1	6.1	6.3	6.0
≥2	1.1	1.2	1.0
Unknown	0.1	2.0	0.0
Planned method			
Sterilization	8.2	9.4	7.0
Pills/injectables	45.8	45.2	46.3
IUD	16.4	17.1	15.7
Other*	16.8	18.3	15.5
None	11.9	9.0	14.7
Unknown	0.9	1.0	0.8
Total	100.0	100.0	100.0

*Includes condoms, contraceptive foams and jellies, abstinence, breastfeeding, rhythm and withdrawal.

standard family planning information usually provided at the clinic. Although all the methods of contraception available at the hospital were discussed, the information did not stress the increased risks associated with high parity. The staff providing this counseling had received no special training in information and education procedures and did not follow a standard protocol. The information they provided on surgical contraception was incomplete and did not address the major fear of women in the Benin region: that sterilization in this lifetime would make them infertile in subsequent reincarnations.

At the time of their enrollment in the study, women in both the treatment and the control groups were interviewed to obtain information on their social and demographic characteristics, as well as on their knowledge of contraceptive methods, contraceptive use and desire for additional children. Sterilizations were performed at delivery or immediately postpartum. Women from both groups were also interviewed at six weeks postpartum to obtain information on delivery outcomes, contraceptive plans and attitudes toward sterilization. Hospital records were checked to identify sterilized women who failed to return for their postpartum visit. Women who were not interviewed at six weeks and who did not have a sterilization record were assumed not to have been sterilized.

More than 99 percent of those admitted to the study were interviewed at admission. Almost 90 percent of the women in the treatment group received counseling all four times; only two did not attend any sessions. In addition, more than 90 percent of the women were interviewed at six weeks postpartum. A patient's failure to return for prenatal visits and at six weeks postpartum was the primary reason that patients missed counseling sessions or did not have a follow-up interview.

Patient Characteristics

More than 1,000 high-parity women were admitted for prenatal care during the study period. Baseline social, demographic and reproductive health characteristics are presented in Table 1 (page 67). There were no significant differences between the treatment and control groups with regard to any of the characteristics surveyed. Neither were any differences found between women who returned at six weeks postpartum and those who failed to return. Since the random allocation succeeded in creating similar treatment and control groups, and since the women who did not complete follow-up were similar to those who did, we feel confident in attributing any differences in sterilization rates to the information and education program.

Women in the study had a mean age of 31, and 90 percent were aged 25–39. However, five percent of the women pregnant with their fifth-order birth or higher were aged 20–24, and five percent were 40 or older. More than half came from one ethnic group, the Edo; 15 percent were Ibo, 10 percent Ishan and the remaining 22 percent came from at least 10 other smaller ethnic groups. The high-parity women who deliver at the teaching hospital in Benin are urbanized and better educated than are most Nigerian women. Almost 85 percent of the women had had at least a primary education, and 14 percent had had some postsecondary schooling. Forty-three percent of the high-parity women were Protestant, 27 percent were Catholic and 25 percent followed a traditional religion.

As for reproductive health characteristics, 43 percent of the women had six or more previous deliveries, and 21 percent had seven or more. Only seven percent of the women, however, had ever had a cesarean section. In spite of the high parity, 10 percent of the women currently had fewer than four living children, and only half of those who had borne seven or more children had that many living children. Overall, 30 percent of the women had experienced the loss of at least one child in its first year of life, and seven percent had seen two or more children die as infants.

The women in the study were more knowledgeable about family planning than are most Nigerian women. Forty-five percent of them knew about female sterilization, and more than 85 percent knew about injectables, IUDs and oral contraceptives (not shown). In addition, 32 percent had used oral contraceptives at some point, 11 percent had used the IUD and seven percent had used injectables. As Table 1 shows, 87 percent planned to use a contraceptive method after delivery, including eight percent who said at their first prenatal visit that they planned to be sterilized.

Table 2 contains information on the women's attitudes toward their current pregnancy and whether they desired more children. Fifty-five percent of the women said they wanted their current pregnancy as well as more children, 30 percent said they wanted the current pregnancy but no more children and 11 percent said they wanted neither the current pregnancy nor more children. The latter proportion increased with the number of living chil-

Table 2. Percentage distribution of high-parity women, by study group and number of living children, according to desire to limit family size

Group and no. of living children	N	Wanted current pregnancy and more children	Wanted current pregnancy but no more children	Didn't want current pregnancy or more children	Not sure	Total
TOTAL						
All	**1,011***	**54.7**	**30.0**	**11.3**	**4.0**	**100.0**
0–3	97	82.5	15.5	0.0	2.0	100.0
4	333	70.3	21.9	2.7	5.1	100.0
5	307	55.7	32.6	8.8	2.9	100.0
6	163	33.1	39.9	22.7	4.3	100.0
≥7	111	13.5	45.9	36.9	3.7	100.0
TREATMENT						
All	**508***	**57.0**	**30.3**	**9.6**	**3.1**	**100.0**
0–3	47	91.5	6.4	0.0	2.1	100.0
4	173	69.9	24.9	1.7	3.5	100.0
5	149	60.4	30.9	5.4	3.3	100.0
6	91	30.8	41.8	24.2	3.2	100.0
≥7	48	16.7	50.0	33.3	0.0	100.0
CONTROL						
All	**503**	**52.5**	**29.8**	**12.9**	**4.8**	**100.0**
0–3	50	74.0	24.0	0.0	2.0	100.0
4	160	70.6	18.8	3.8	6.8	100.0
5	158	51.3	34.2	12.0	2.5	100.0
6	72	36.1	37.5	20.8	5.6	100.0
≥7	63	11.1	42.9	39.7	6.3	100.0

*Excludes one woman who refused to be interviewed.

dren, so that slightly more than one-third of the women with seven or more children said that they did not want the current pregnancy. Only among women expecting at least their seventh child did more than half report that they did not want any more children.

Unless women were to change their minds, these data indicate that only 40 percent would be candidates for female sterilization, and fewer than 25 percent of women with four living children might be interested. Among those who did not want any more children, almost half (48 percent) said they could not afford more children, and 14 percent gave health reasons.

Data collected at six weeks postpartum indicate that most women in the study delivered vaginally; only three percent had a cesarean section. Among 97 percent of the women, the baby was still alive at the time of the interview; among two percent, the child had died after a live birth. The remainder of the women experienced a miscarriage or a stillbirth. One woman was known to have died, and 84 did not return at six weeks.

Counseling Results

Women in the treatment group were more likely to choose sterilization than were women who received no special information—13 percent, compared with three percent. The difference was statistically significant ($p<0.001$). The proportion of women sterilized is presented in Table 3, according to various social, demographic and reproductive characteristics. In every category, women in the treatment group were more likely than women in the control group to undergo sterilization. This was especially true among counseled women in the 30–34 age-group and those with seven or more living children, both of whom were about 10 times more likely than controls to choose sterilization.

Within the treatment group, the older a woman was and the more children she had, the more likely she was to choose sterilization. This association probably reflects the counseling on increased health risks among high-parity and older women. Among women in the control group, only those 35 or older were significantly more likely to be sterilized; parity had no effect. Regardless of study group, the proportions choosing sterilization were small among women who had four or fewer children, not counting the current delivery.

In both groups, there was little variation by ethnicity, education and religion in the proportion of women who chose to be sterilized. Women who delivered by cesarean section, however, were more likely to obtain a sterilization than were women who delivered vaginally: Half of the women in the treatment group and a quarter of those in the control group who delivered by cesarean section obtained sterilizations, compared with 12 percent and three percent, respectively, of those who delivered vaginally. Two of the six women in the treatment group who had cesareans and opted for sterilization had had three prior cesarean deliveries and would have been strongly advised by their obstetrician to select a permanent method of contraception. According to the protocol, they should not have been included in this study. If they are excluded from the analysis, the overall sterilization rate declines slightly (to 12.6 percent), but the difference between the groups remains significant.

Almost 80 percent of the women in the treatment group who said that they planned to be sterilized went through with the operation. This was true for only 43 percent of the control group. Unless they have a solid understanding of sterilization, women who express interest in the procedure may not feel strongly enough to follow through on their desire. The proportion of women in the treatment group who were sterilized was lower among those who had planned to use a clinical method than among those who had planned to use other methods. Perhaps women who are knowledgeable about other effective methods are less likely to choose sterilization.

In both groups, women who wanted neither the current pregnancy nor more children were the most likely to choose sterilization, with 39 percent of the treatment group and 11 percent of the control group doing so. Among women who wanted the current pregnancy but no more children, 23 percent of the treatment group chose sterilization, as did six percent of the control women. A few women (nine in the treatment group and one in the control group) who said at admission to the program that they wanted more children also decided to be sterilized; three of these women had indicated at admission that they planned to be sterilized. Three other women had cesarean sections for this delivery and had medically indicated sterilizations; the remaining four may have changed their minds about having more children.

Sixty-six women in the treatment group underwent sterilization following childbirth. Although 63 women reported at the end of the first counseling session that they wanted to be sterilized, only 45 of those women carried through with their decision. An additional 24 women selected sterilization at later counseling sessions, and 21 of them actually had the operation. Although 68 percent of the women who chose sterilization made their decision in the first counseling session, the later sessions may have been of greater benefit than implied by these data: More women might have changed their minds if there had been only one counseling session early in the prenatal period. The later sessions may

Table 3. Percentage of women who underwent sterilization, by various characteristics, according to study group

Characteristic	Treatment		Control	
	%	N	%	N
Total	**13.0**	**509**	**3.4**	**503**
Age				
<30	3.5	173	1.7	180
30–34	11.8	203	1.1	180
≥35	27.5	131	8.8	136
Unknown	0.0	2	0.0	7
Ethnicity				
Edo	12.9	264	3.3	275
Ibo	12.3	73	4.0	75
Ishan	10.5	57	4.2	48
Other	14.8	115	2.9	105
Education				
None	15.9	88	2.6	78
Primary	11.8	254	2.5	276
Secondary	14.6	89	6.0	83
Postsecondary	11.7	77	4.5	66
Unknown	0.0	1	0.0	0
Religion				
Catholic	13.1	137	3.6	138
Protestant	14.8	229	2.5	201
Traditional	11.4	114	4.5	134
Other/unknown	3.4	29	3.3	30
Living children				
0–3	4.3	47	4.0	50
4	5.8	173	0.0	160
5	8.7	149	5.7	158
6	20.9	91	4.2	72
≥7	45.8	48	4.8	63
Unknown	0.0	1	0.0	0
Type of delivery				
Vaginal	12.2	460	2.8	436
Cesarean	50.0	12	26.7	15
Miscarriage	0.0	2	0.0	0
Unknown	11.4	35	1.9	52
Contraceptive plan at admission				
Sterilization	79.2	48	42.9	35
Pills, injectables, IUD	4.1	317	0.3	312
Other/unknown	14.3	98	0.0	82
None	2.2	46	1.4	74
Family limitation desires				
Didn't want pregnancy; didn't want more	38.8	49	10.8	65
Wanted pregnancy; didn't want more	23.4	154	6.0	150
Wanted pregnancy; wanted more	3.1	290	0.4	264
Unknown	12.5	16	0.0	24

Table 4. Percentage distribution of women who had heard of sterilization, by attitude toward the operation, according to when questioned and treatment group

Attitude	At admission	Six weeks postpartum		
	All patients	Treatment group		Control group
		Sterilized	Not sterilized	
N	456	66	414	383
Operation is safe				
Agree	30.9	100.0	61.1	20.4
Disagree	17.8	0.0	31.4	30.0
No opinion	51.3	0.0	7.0	49.6
Unknown	0.0	0.0	0.5	0.0
Women are as strong as before				
Agree	22.4	98.4	62.1	19.8
Disagree	20.8	0.0	13.3	14.4
No opinion	56.8	1.6	24.2	65.8
Unknown	0.0	0.0	0.5	0.0
No change in sex drive				
Agree	30.5	91.9	64.0	18.3
Disagree	6.4	3.2	4.1	6.8
No opinion	63.1	4.8	31.4	74.9
Unknown	0.0	0.0	0.5	0.0
Woman's status does not change				
Agree	38.8	96.8	66.9	23.8
Disagree	8.1	1.6	15.8	6.8
No opinion	51.1	1.6	13.8	69.5
Unknown	2.0	0.0	0.5	0.0
Total	100.0	100.0	100.0	100.0

Note: Women who did not complete the baseline interview or who did not return at six weeks postpartum are excluded. The 17 women in the control group who were sterilized are also excluded.

have provided additional information to reinforce the original decision and helped some women who were unsure to make a decision.

At six weeks postpartum, women in the treatment group who had decided against sterilization were asked why. Thirty-three percent said they wanted more children, and 28 percent said they had done so because of fear of the operation or its complications. Another 16 percent said they did not want the operation because they believed sterilization might persist through reincarnation, six percent said their husband objected to sterilization and three percent said they preferred a reversible method. The remaining women gave a variety of reasons.

Understanding Sterilization

Counseling improved the understanding of female sterilization. At admission, only 45 percent of the women in the study had heard of the operation. Most of those who had heard of it did not understand the procedure, and they described it as an operation where the womb is tied or the womb is turned. Only seven percent understood sterilization to be having the fallopian tubes tied.

At six weeks postpartum, however, all of the treatment patients said they had heard of sterilization, and these women, especially those who had chosen sterilization, were the most well-informed about the operation. At six weeks postpartum, 61 of the 62 women in the treatment group who underwent sterilization and returned for the checkup correctly described the operation; almost 90 percent of counseled women who were not sterilized also gave a correct description. In comparison, 90 percent of women in the control group also said they had heard of sterilization, either during their admission interview or by talking with counseled women at the hospital. They still had a limited understanding of the surgery, however, with almost 90 percent describing it as tying or turning the womb.

Women who said they had heard of sterilization were asked about their attitudes toward it, and the results are shown in Table 4. At admission, between half and three-quarters of the women had no opinion or held an unfavorable opinion about whether the operation was safe, weakened women, changed women's sex drive or changed their status. By six weeks postpartum, attitudes toward the operation had improved among all counseled women. This improvement was especially great among those who were sterilized, but women in the treatment group who did not undergo the operation also had much more positive attitudes toward it than did those who were not counseled. For example, slightly more than 60 percent of those in the treatment group who were not sterilized said they believed the operation was safe, compared with 20 percent of women in the control group. Nonetheless, they were not as convinced as women who had the operation that there would be no ill effects. Women in the control group were just as uncertain about the operation at six weeks postpartum as they were at admission.

The program also had an important effect on contraceptive use after delivery. At admission, half of the women had never used a contraceptive method, but almost 90 percent said they planned to use a method after delivery. At six weeks postpartum, counseled women were significantly more likely than those in the control group to have followed through on their intentions ($p<0.001$), as is shown in Table 5. Seventy-one percent of the counseled women were using a medical or barrier method of contraception. In contrast, 51 percent of control women were using one of these methods.

Table 5. Percentage distribution of women using a contraceptive method at six weeks postpartum, by method, according to study group

Method	Treatment group (N=480)	Control group (N=453)
Clinical	70.5	50.8
Sterilization	13.8	3.8
Pill/injectable	35.2	27.8
IUD	19.6	17.0
Barrier	1.9	2.2
Traditional	14.5	18.6
None	14.1	28.9
Unknown	0.9	1.7
Total	100.0	100.0

Note: This table excludes women who were not sterilized and who did not return for the sixth week interview, because their contraceptive use is unknown.

Conclusions

The information and education program had a significant impact on a woman's decision to utilize a contraceptive method postpartum. In addition, counseled women of every ethnic and religious group were more likely to request sterilization. The study suggests that the current low rates of voluntary female sterilization may be due, in part, to a lack of knowledge and understanding of sterilization, since half of the women admitted to the program had never heard of the operation, and most of those who had did not understand what it entailed.

A sterilization rate of 13 percent among high-parity women counseled four times about the health impact of multiple births and the benefits of family planning may not seem impressive when compared to the worldwide prevalence of voluntary female sterilization. However, it is notable among Nigerian women for several reasons. First, the rate is almost twice as high as the seven percent sterilization rate among high-parity women at the same hospital in 1981.[11] Second, there is a strong preference for large families in Nigeria, where childbearing is of great social importance. Women may, therefore, be reluctant to choose a permanent method despite the risk to their health of further childbearing. Finally, one-fourth of the women in this study had experienced the death of a child during infancy, and 10 percent of them had experienced infant death following their most immediate previous pregnancy.

In this setting, consideration needs to be

given to the cost-effectiveness of counseling women with less than a minimum number of children. Sixty-two percent of women in the treatment group who chose sterilization had six or more children, not including the current pregnancy, and 82 percent had five or more living children. If women with fewer than five children had been counseled only once, the number of counseling sessions would have decreased by a third, and the number of sterilizations would have decreased by no more than 10 percent, assuming rates similar to those in the control group.

Even women with five or more children may not need to have as many as four counseling sessions. Women who decide to be sterilized on their first visit may need only one additional session to be provided with more detailed information. Sessions should be conducted as early as possible after the 20th week of gestation to enable the couple to think through this important decision.

Another way to decrease the costs of the program could be to see only once those women who say at admission that they want more children, since this was the most common reason for not having the operation. If such women had had only one session, the number of sterilizations in the treatment group would have decreased by a maximum of 14 percent, and the number of counseling sessions would have declined by 44 percent.

While either strategy to limit the number of sessions would decrease program costs, it might also decrease the number of women who choose some other method of contraception. Some postpartum counseling on contraception is undoubtedly needed for all women.

One-fourth of women said they chose not to undergo sterilization because of fear or dislike of surgery. Therefore, the program obviously needs to emphasize the safety of the operation in order to allay these fears. Overall, the program had an impressive impact on women's knowledge and attitudes toward female sterilization. Improvement in these areas may translate into an increased demand for sterilization services later, either among those exposed to the program or among those with whom they share information.

A good counseling program, however, must be designed to help women understand all methods of family planning. This will enable them to make well-informed, well-considered decisions about their fertility. The process should not attempt to persuade a couple to select a particular method, such as sterilization. If the process has been respectful of individual preferences, the chances that the couple will regret the sterilization decision will be minimized. Satisfied clients can then become advocates for family plannning, and their support will increase demand for services and help to reduce maternal mortality.

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Resumen

A efectos de informar a las mujeres de los riesgos de la alta paridad y hacer que se comprendan mejor los métodos de regulación de la fecundidad, el Hospital Académico de la Universidad de Benin ha emprendido un programa de planificación familiar y educación para embarazadas que hayan dado a luz cuatro o más veces. Durante un período de 19 meses, más de 1.000 mujeres de esta categoría que habían acudido para recibir asistencia prenatal fueron asignadas al azar, o bien a un grupo terapéutico a cuyas integrantes se les ofrecieron cuatro sesiones de asesoramiento individual acerca de métodos anticonceptivos y los peligros que suponía para la salud una alta paridad, o bien a un grupo de control que sólo recibió la información sobre planificación familiar que la clínica prenatal ofrece habitualmente.

En términos generales, a las seis semanas post-parto, utilizaba algún método anticonceptivo eficaz el 71 por ciento de las mujeres del grupo terapéutico, contra el 51 por ciento de las del grupo de control. Cerca del 40 por ciento de las integrantes de ambos grupos habían indicado, a la entrevista inicial, que no querían tener más hijos, pero las del grupo terapéutico se manifestaban significativamente más propensas que las del grupo de control a optar por la esterilización femenina como método anticonceptivo post-parto—13 por ciento contra tres por ciento. Según la edad, la proporción de esterilizadas del grupo terapéutico variaba del cuatro por ciento para las menores de 30 años al 28 por ciento para las de 35 años o más. En el grupo de control, las cifras correspondientes eran, respectivamente, del dos y nueve por ciento. En el grupo terapéutico, decidió esterilizarse el seis por ciento de las mujeres que tenían cuatro hijos vivos, frente al 46 por ciento de las que tenían siete o más. Entre las del grupo de control, los respectivos porcentajes fueron de cero y cinco por ciento.

Résumé

Afin d'informer les femmes des risques que comporte une parité élevée et d'améliorer leur compréhension des moyens anticonceptionnels, surtout la stérilisation chirurgicale, l'Hôpital Académique de l'Université de Bénin a lancé un programme de planning familial et d'éducation destiné aux femmes enceintes ayant déjà eu au moins quatre accouchements. Pendant une période de 19 mois, plus de 1.000 femmes à parité élevée, venues recevoir des soins prénatals, ont été placé de façon aléatoire soit dans un groupe thérapeutique dans lequel on leur offrit quatre cours sur les méthodes de contraception et les risques que comporte une parité élevée, soit dans un groupe de contrôle où ne leur était donnée que l'information standard dispensée pendant les consultations prénatales.

En général, 71 pour cent des femmes du groupe thérapeutique utilisaient une méthode de contraception efficace à la sixième semaine post-natale, comparé à 51 pour cent des femmes du groupe de contrôle. Dès leur entrée au programme, près de 40 pour cent des participantes des deux groupes avaient mentionné ne plus vouloir d'enfant, mais après l'accouchement, celles du groupe thérapeutique étaient sensiblement plus susceptibles que celles du groupe de contrôle d'opter pour la stérilisation comme méthode contraceptive—13 contre trois pour cent. Selon l'âge, la proportion de femmes stérilisées du groupe thérapeutique s'échelonnait entre quatre pour cent de celles ayant moins de 30 ans à 28 pour cent de celles ayant 35 ans ou plus. Dans le groupe de contrôle, les chiffres correspondants étaient de deux et neuf pour cent respectivement. Dans le groupe thérapeutique, six pour cent des femmes ayant eu quatre enfants décidèrent de se faire stériliser, ce chiffre étant de 46 pour cent parmi les femmes qui avaient eu sept enfants ou plus. Dans le groupe de contrôle, les pourcentages respectifs étaient de zéro et de cinq pour cent.

DIGEST

In Mali, Marriage Is Early, Childbearing Is Frequent And Modern Contraceptive Practice Is Uncommon

The strong pronatalism of the inhabitants of Mali and their lack of access to family planning services are clearly reflected in the country's high total fertility rate of 6.7 children per woman, their pattern of very early marriage and the low level of contraceptive prevalence. The use of modern birth control methods is limited almost exclusively to younger, urban women with some schooling. Although half of all women in a union say they want to either space or limit their births, only 11 percent of those who do not practice contraception intend to use a method in the near future. The attitude of men toward family planning is considerably more conservative than that of women: Only 17 percent of men approve of it, compared with 71 percent of women. These are some of the findings from the Enquête Démographique et de Santé au Mali (EDS), carried out in 1987 among a sample of 3,200 women aged 15–49, a sample of 970 husbands aged 20–55 and a sample of 1,538 children aged 6–36 months.[1]

Mali, a landlocked West African country of 7.6 million, is bordered by Algeria to the north, Côte d'Ivoire and Guinea to the south, Niger to the east and Senegal and Mauritania to the west. The Bambara are the largest ethnic group in the country, followed by the Peul, the Sarakolé, the Malinké and the Dogon. Seventy-four percent of the population live in rural areas. Islam is the principal religion of Malians, and the practice of polygamy is quite common.

Overall, only 13 percent of women in Mali can read. Fifteen percent have had some schooling—14 percent, a primary education and one percent, a secondary education. However, education levels are rising slightly: Twenty percent of women under 30 have had some schooling, compared with just eight percent of those 30 and over. Further, urban women are much more likely than their rural counterparts to have received a primary education (35 percent vs. seven percent), and the proportion of women who have done so reaches 41 percent in Bamako, the country's capital.

Men in Mali are more likely than their wives to be literate: Sixty-nine percent can read with at least some proficiency. Nevertheless, only 23 percent of men have had formal schooling—16 percent a primary education and seven percent a secondary or higher education.

Nuptiality and Fertility

The median age at marriage among Malian women, 15.7 years, is one of the lowest in Africa. Although this age has remained below 16 for at least the past 35 years, there is some indication that younger women and those with a primary education are now marrying slightly later than did their older, uneducated counterparts: In 1987, the median age at marriage among urban women aged 20–24 was 16.2, while among those aged 45–49 it was 15.4; likewise, the median was 15.7 among women with no education, 16.3 among those with primary schooling and 19.2 among the few women with a secondary education.

By the time they reach their middle 20s, all Malian women have married; even among 15–19-year-olds, the proportion married is as high as 75 percent. At the time of the survey, 92 percent of female respondents were currently married, and almost half (45 percent) of such women were in a polygamous union. As expected, the proportion of women in a polygamous union increases with age, from 28 percent of 15–19-year-olds to 63 percent of 45–49-year-olds. Further, such unions are more prevalent among rural women than among urban women (48 percent vs. 37 percent).

In general, men marry later than women: Whereas 80 percent of 20–24-year-old men are single, only eight percent of 30–34-year-olds are unmarried. By the time they have reached their middle 40s, all men have married at least once. At the time of the survey, 25 percent of men were practicing polygamy. As is the case with women, older men are more likely than their younger counterparts to be in polygamous unions: Three percent of those under 30 were in such unions, compared with 34 percent of those 30 or over. The proportion of men in such unions decreases considerably with education: Twenty-seven percent of men with no schooling are polygamous, as are 18 percent of those with a primary education and only 10 percent of those with a secondary education.

In 1987, among women in all age-groups, the median age at first birth was 18.9. However, urban women were slightly older at first birth than were rural women (19.2 vs. 18.8). In Bamako, the median age was considerably higher among women aged 20–24 than among those aged 40–44 (19.7 vs. 17.9). There was no difference by education in age at first birth.

The overall total fertility rate (TFR) for the period 1984–1986 among women aged 15–44 was 6.7 lifetime births per woman. Urban women had a TFR of 6.1, almost one birth lower than the TFR among rural women (7.0); among women in Bamako, the TFR was 5.4. Only three percent of women 45–49 were childless, suggesting that at least three percent of Malian women are infecund.

At the time of the survey, 45 percent of married women were not exposed to the risk of pregnancy, because they were pregnant, were practicing postpartum abstinence or were experiencing postpartum amenorrhea. Although Malian women practice postpartum abstinence for only seven months, on average, the mean duration of postpartum amenorrhea is 15 months. The length of this period is principally attributable to the practice of prolonged breastfeeding, which lasts an average of 22 months. However, perhaps because urban women breastfeed for shorter

periods than do their rural counterparts (20 months vs. 22 months), they experience a somewhat shorter period of postpartum amenorrhea and are exposed to the risk of pregnancy sooner than are rural women.

Contraceptive Knowledge and Use

Only 43 percent of currently married women have heard of at least one method of birth control; 29 percent have heard of a modern method and 37 percent have heard of a traditional method. Women under the age of 35 are only slightly more knowledgeable than are older women. On the other hand, urban women are almost twice as likely as rural women to be familiar with any method (68 percent vs. 35 percent), and are three times more likely to know of a modern method (57 percent vs. 19 percent). Among married women who know of a modern method, 22 percent have heard of the pill, 17 percent of injectables, 15 percent of the IUD, 14 percent of female sterilization and eight percent of the condom. Prolonged abstinence and *gris-gris*,* each familiar to 24 percent of currently married women, are the two best-known traditional methods. However, most of the knowledge revealed by the survey was elicited by probing. For example, only seven percent of women were able to spontaneously name the pill, and fewer than three percent of women could give any of the other modern methods without having been prompted.

Among Malian men, 65 percent have heard of at least one method, but only a small proportion (six percent or fewer) can spontaneously name a specific method. After prompting, the men are most likely to recognize the pill (38 percent); among other modern methods, more than three in 10 know of injectables (32 percent), female sterilization (32 percent) and the condom (31 percent), while the most widely known traditional methods are gris-gris, prolonged abstinence and periodic abstinence (33, 31 and 24 percent, respectively). Urban men are more likely than rural men to be familiar with at least one method (80 percent vs. 60 percent).

Contraceptive prevalence is very low in Mali: Fewer than five percent of married women and a similar proportion of all men report that they currently use a method of contraception (three percent use a traditional method and one percent a modern method). Nevertheless, urban women aged 15–29 are much more likely than comparable rural women to use any method (12 percent vs. two percent), with almost five percent of urban women using modern methods (principally the pill) and the rest relying on traditional methods (mainly periodic or prolonged abstinence). Educational level appears to have the greatest impact on current use: Three percent of young women with no schooling, 13 percent of those with a primary education and 53 percent of those with a secondary education are current users.

Among all married women, 32 percent say they want to wait at least two years until the birth of their next child, and 17 percent say they do not want any more children. Nevertheless, only 11 percent of women who are not practicing contraception say they intend to use contraceptives in the near future (21 percent of urban women and eight percent of rural women). Of the women who plan to use a method, the majority (70 percent) say they would choose modern methods, mainly the pill or injectables.

The principal reason given for contraceptive nonuse by women who do not want to get pregnant soon is lack of information about family planning. Among women who have heard of at least one method, 71 percent approve of family planning, with those aged 20–34, the urban and the educated most likely to approve of it. In contrast, only 17 percent of men approve of contraceptive use, with urban and educated men more likely than their rural and uneducated counterparts to do so. Interestingly, there is very little difference between people's own attitudes toward family planning and what they perceive to be the attitude of their spouse. For example, only 16 percent of the husbands sampled thought their wives approved of family planning, while 57 percent of the wives thought their husbands approved. Such erroneous perceptions are not surprising, however, since only eight percent of husbands and wives who were jointly interviewed said they had ever discussed family planning together.

Maternal and Child Health

Overall, only 31 percent of the women who had had a child in the five years preceding the survey had received prenatal care, with urban women much more likely than rural women (70 percent vs. 19 percent) and women with a primary education more likely than those with no schooling (59 percent vs. 27 percent) to have done so. Moreover, 64 percent of women who gave birth did so without the aid of medical personnel; of these, 30 percent used a traditional birth attendant, 21 percent were helped by a neighbor or relative and 13 percent received no assistance at all.

Despite declines in the last 15 years, levels of infant and child mortality remain very high in Mali: Between 1982 and 1987, the infant mortality rate was 108 deaths per 1,000 live births, and the child mortality rate was 249 deaths per 1,000 children under the age of five. About one out of every four Malian children aged 3–36 months experience chronic malnutrition. Further, the prevalence of diarrhea among children is high: In the two weeks preceding the survey, 34 percent of children under five had had an episode of diarrhea, but only one percent had been given oral rehydration therapy, and 32 percent had not received any treatment at all.

*Gris-gris are amulets worn by women in an attempt to prevent pregnancy.

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Moderate Fertility Rates And Levels of Method Use Mark Ecuador DHS Results

Forty-four percent of married Ecuadoran women practice family planning, but three-fifths of married women who do not want any more children either are not using a contraceptive method or are using an ineffective method. At current rates of childbearing, women will have borne just over four children by the end of their reproductive years, on average, one more than the family size they consider to be ideal. These are some of the major findings of the Encuesta Demográfica y de Salud Familiar carried out in Ecuador in 1987.[1]

The survey, which was part of the worldwide Demographic and Health Survey project, was based on a sample of 4,713 women aged 15–49. Of these women, eight percent had never had any schooling, 15 percent had not completed primary school, 33 percent had completed primary school and 45 percent had had at least some secondary education. Among the oldest women, 22 percent had never been to school, whereas among the youngest, this proportion was only three percent, indicating a considerable improvement in female education over the past 30 years. Fifty-nine percent of the women live in urban areas, with the remaining 41 percent in rural areas. The birthrate in Ecuador is estimated to be about 37 births per 1,000 population

(down from about 45 per 1,000 in the 1960s); that, combined with a death rate of about eight per 1,000 population, results in an annual growth rate of 2.8 percent.

Marriage and Fertility

The median age at marriage has remained virtually unchanged in Ecuador (at around 20) for the past 30 years, with some small variation by urban-rural residence and the woman's educational level. Only among women with a college education is there any marked tendency to delay marriage, however. These women do not marry until they are 25, on average.

At the time of the survey, 63 percent of women were currently married (42 percent in a legal and 21 percent in a consensual union), six percent were widowed, divorced or separated and 31 percent had never been married. Among the single women, only one percent of those surveyed were exposed to the risk of pregnancy. Among the currently married, 10 percent were pregnant, 14 percent were amenorrheic following a pregnancy, 15 percent were no longer fecund and 11 percent had not had sexual intercourse recently, leaving only 50 percent actually exposed to the risk of pregnancy.

The total fertility rate (TFR) for the five years preceding the survey is estimated to have been 4.3 lifetime births per woman, a reduction of 38 percent since the second half of the 1960s, when the TFR is estimated to have been 6.9. Women 30–39 experienced the greatest decline in their age-specific fertility and 45–49-year-olds the smallest. Among women in urban areas, the TFR is estimated to have been 3.5 lifetime births, while among rural women it was 5.5. The highest TFR is found among women with no schooling (6.4 births), and by far the lowest is among those with some college education (2.3 births).

In 1979, 57 percent of all childbearing was accounted for by women under 30. By 1987, this proportion had risen slightly to 60 percent, which suggests that Ecuadoran women are increasingly concentrating their childbearing into their earlier reproductive years.

Teenage childbearing in Ecuador seems to follow the pattern of other Latin American countries. Fourteen percent of all women 15–19 (and 67 percent of all married teenagers) have had at least one birth. The age-specific fertility rate among Ecuadoran women 15–19 for the five years preceding the 1987 survey (91 births per 1,000) is even higher than the rates found in Brazil (81 births per 1,000),[2] Colombia (78 per 1,000)[3] and Peru (83 per 1,000)[4] in 1986.

There is a clear relationship among Ecuadoran women between fertility and early age at entry into marriage or nonmarital union (both of which are considered "marriages" here). Among women married for at least 20 years, those who first entered into a union before age 20 have had 6.8 children, on average, compared with 5.4 among those who delayed entering into a union until later.

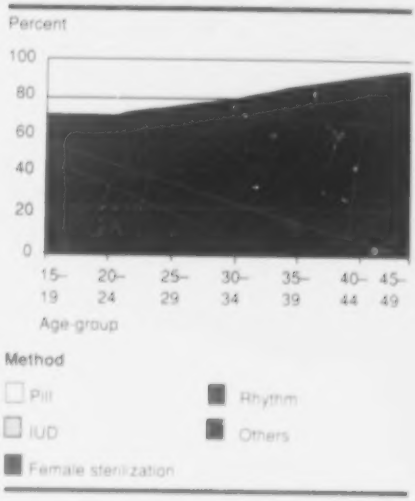
On average, women in Ecuador say they would ideally like to have three children. Among women who already have four children, 47 percent say they would ideally have wanted fewer, and among those with five children, 65 percent say their ideal would be a smaller family.

Family Planning Practice

Eighty-seven percent of women know of at least one modern method of birth control.* The most widely known method is the pill (81 percent), followed by the IUD (75 percent), female sterilization (74 percent), injectables (60 percent) and the condom (47 percent). However, the perception of problems associated with the use of these methods is widespread. Among women who know of the pill and the IUD, only 20 percent believe these methods to be trouble-free. A further 20 percent believe that each method creates health problems for the user, 30 percent say that the pill, but not the IUD, has side effects and 20 percent believe that the IUD has side effects but the pill does not. Furthermore, among those who know of condoms and other barrier methods, one woman in seven believes that such methods are not effective at preventing pregnancy. In contrast, while 42 percent who know of rhythm say that there are no problems associated with its practice, another 26 percent believe it is an ineffective method.

All women who knew of at least one method of contraception were asked where they would obtain contraceptives if they decided to use a method. One-third expected they would obtain their method from clinics and hospitals run by the Ministry of Health, while 27 percent would go to private doctors or clinics, 16 percent to the private family planning association and 12 percent to pharmacies. Just over half of the women said that if they were to be sterilized they would obtain the operation at a Ministry of Health facility. Forty-one percent said that they would purchase condoms commercially.

Figure 1. Percentage distribution of currently married women practicing contraception, by method used, according to age-group, Ecuador, 1987



Twenty-nine percent of all women 15–49 and 44 percent of married women were practicing family planning at the time of the survey. This rate among married women represents a slight increase from the prevalence level of 40 percent reported in 1982, all of which appears to be attributable to a rise in contraceptive practice among rural women from 27 percent to 33 percent between 1982 and 1987; no such increase was seen among urban women, 53 percent of whom were practicing contraception in both years.

The leading method of birth control in Ecuador is female sterilization, with 15 percent of married women relying on this method. It is followed by the IUD (10 percent), the pill (nine percent) and rhythm (six percent). As Figure 1 indicates, the pill and the IUD are the leading methods of birth control among younger married women; after age 30, however, sterilization assumes major importance, at the expense of reversible methods such as the pill and the IUD. Only reliance on rhythm remains at a relatively constant level at every age. A comparison of the results of the 1982 and 1987 surveys reveals a slight change in the method mix over time, with reliance on the IUD increasing over the period and use of the pill declining.

Six out of 10 married women in Ecuador have practiced contraception at some time in their lives. However, almost nine in 10 of these women did not begin to practice contraception until after the birth of their

*Male and female sterilization, the pill, the IUD, injectables, the condom, the diaphragm and spermicides.

first child, and over one-third did not initiate use until they already had had three or more children. However, the analysis shows that younger women are starting to use a method at lower parities than did the preceding generation, and the practice of family planning in order to delay the first birth is increasing.

Ecuadoran women are 31 years old, on average, when they opt for sterilization. Among women sterilized within the five years preceding the survey, the average age was 32, whereas the mean age at the time of the operation among women sterilized 12 or more years before was 28. The authors of the report point out that the women sterilized many years before had probably had more children at an earlier age than have more recently sterilized.

The unmet need for contraception appears to be considerable in Ecuador. Among married women who say they want no more children, 50 percent are not using any method of birth control and eight percent are using an ineffective method. However, it should be recalled that only half of married women are actually exposed to the risk of pregnancy; thus, realistically, the level of unmet need is probably actually a good deal lower.

Maternal and Child Health

The survey also examined some aspects of maternal and child health in Ecuador. The researchers estimate on the basis of their findings that the infant mortality rate for the period 1982–1986 was 58 deaths per 1,000 live births, a level substantially lower than the estimates of 72 per 1,000 in the late 1970s and of 97 per 1,000 in the early 1970s. In rural areas, the infant mortality rate was 64 deaths per 1,000 live births, while in urban areas it was 53 per 1,000. As might be expected, the rate is inversely related to a region's level of urbanization and to the mother's educational level. In Guayaquil, almost 68 percent of homes have piped drinking water, 57 percent have drainage systems and 99 percent have electricity; in the rural area of the Costa region, on the other hand, these proportions are 10 percent, two percent and 50 percent, respectively.

Levels of prenatal and maternity care are also lower in the country's less developed regions. Only 16 percent of urban women giving birth in the five years before the survey received no prenatal care, compared with 38 percent of rural women. Similarly, 82 percent of urban women were attended by a doctor or trained midwife at the time they gave birth, compared with only 37 percent of rural women.

Interviewers questioned women about their baby's health. They found that only 54 percent of urban mothers and 41 percent of rural mothers had taken their most recent child born in the past five years for well-baby care. Moreover, 56 percent of all children under five had suffered from a cough in the two weeks before the survey, and 39 percent had had a bout of diarrhea.

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After Four Years, One in 100 Female Sterilizations Fail, Brazilian Study Concludes

Accidental pregnancy is relatively rare following sterilization, even a number of years later. A Brazilian study of women who underwent tubal occlusion found that 48 months after surgery, slightly more than one in 100 women had become pregnant. The probability of sterilization failure was significantly lower among older women, but was associated with no other personal characteristics of the women. Failure rates were lower among women whose sterilization was performed by a physician who averaged few such procedures per day, although the relationship was not statistically significant.[1,2]

Researchers in Rio de Janeiro conducted a study of 13,423 women who underwent sterilization between January 1, 1981, and December 31, 1984, in a clinic of the Centro de Pesquisas de Assistência Integrada à Mulher e à Criança (CPAIMC), a large umbrella organization of family planning groups in Brazil. Sterilization failure was measured by subsequent pregnancy; however, because there was no active follow-up of the women, only those pregnancies that the women reported to the clinic could be recorded as sterilization failures. A separate active follow-up of 15 percent of the women led the researchers to conclude that the percentage of failures not reported was likely quite low. Nonetheless, they caution that the rates they report should be viewed as low estimates. By June 30, 1985 (the cutoff date for the research), 144 women had reported a pregnancy. Of those, 22 were excluded from the analysis because it was determined that conception had occurred before surgery.

Using a life-table analysis, the investigators estimated cumulative failure rates at various points after sterilization. At six months, the estimated failure rate was 0.28 pregnancies per 100 sterilizations; the rate was 0.54 per 100 at 12 months, 0.87 at 24 months, 0.99 at 36 months and 1.04 at 48 months. Thus, the likelihood of sterilization failure doubled between one and four years after the procedure.

The investigators also used the life-table analysis to estimate failure rates at 12 and 24 months following surgery, according to age, parity, method of sterilization and technique of tubal occlusion. At both points, failure rates decreased with increasing age. None of the other variables showed a statistically significant association with sterilization failure.

Finally, the researchers applied a logistic regression analysis to isolate the effects of the woman's age at sterilization, whether the procedure was performed during a surgical training period, the average number of sterilizations the surgeon performed per day and the year the woman underwent sterilization. Age again showed a negative association with sterilization failure. At 12 months after surgery, the probability of failure among women aged 17–29 was 0.81 per 100 procedures, compared with 0.60 per 100 among those aged 30–34, 0.42 among 35–39-year-olds and 0.29 among those aged 40–51. At 24 months, the respective rates were 1.22, 0.89, 0.65 and 0.45 per 100 procedures. The researchers suggest that this association may be due to decreased fecundity among older women.

The results of the logistic regression analysis also revealed a relationship between the average number of sterilizations a surgeon performed daily and the risk of failure. Among patients of physicians who performed an average of 0–2 sterilizations per day, the probability of failure 24 months after surgery was 0.69 per 100, while among those who performed 7–15 procedures per day, the probability was 0.97 per 100. Although the difference was not statistically significant, the researchers believe that if the sample had been larger, the relationship would have been confirmed.

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Tubal sterilization, the most prevalent contraceptive method in Brazil, is one of the most effective forms of contraception. However, the long-term risk of failure (about one percent after four years) must be acknowledged. The authors of the study point out that "potential acceptors of surgical sterilization have a somewhat different perspective from users of temporary methods, as they consider sterilization to be a definitive termination of their reproductive capability." Thus, it is important that those who consider undergoing female sterilization be made aware of the long-term risk of failure, not just the one-year or two-year failure rate. Such an understanding is particularly vital for women who need to avoid pregnancy for medical reasons.

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Fertility, Infant Mortality Are Very High in World's Least Developed Nations

In the first half of the 1980s, the world's 41 least developed countries were growing at an average annual rate of 2.4 percent and had an average total fertility rate of 6.2 children per woman, an infant mortality rate of 133 deaths per 1,000 live births and a per capita gross national product of slightly over $200. Contraceptive use is low, but many governments have begun to support family planning activities to slow population growth or to promote birthspacing. These are some of the highlights of a report prepared by the Population Division of the United Nations on conditions in the least developed countries.[1]

In 1988, about 370 million people, or approximately seven percent of the world's total population, lived in 41 nations designated by the United Nations General Assembly as the least developed countries in the world. These countries are expected to account for about 12 percent of the world's population by the year 2025. Table 1, which lists selected demographic characteristics of these 41 countries, indicates that 27 are in Africa, nine are in Asia (including five in South Asia), one is in the Caribbean and four are in Oceania.

Between 1980 and 1985, the average annual rate of population growth among the 41 countries was 2.4 percent, down slightly from 2.5–2.6 percent in the 1970s. As the table shows, growth rates ranged from 1.0 percent in Samoa to 3.9 percent in Vanuatu, with 14 countries experiencing rates of three percent or more and seven having rates of less than two percent. Af-

Table 1. Selected demographic characteristics of the least developed countries, by region, 1988

Region and country	Total population (in 000s), 1985	Rate of population change (%), 1980–1985	TFR, 1980–1985	Contraceptive prevalence (%), 1987	Life expectancy at birth, 1980–1985	Infant mortality rate, 1980–1985
Africa						
Benin	4,050	3.0	7.0	9	44.0	120
Botswana	1,078	3.6	6.5	28	56.0	76
Burkina Faso	7,882	2.5	6.5	u	45.2	149
Burundi	4,721	2.8	6.4	9	46.5	124
Cape Verde	330	2.2	5.2	u	59.0	75
Central African Rep	2,576	2.3	5.9	u	43.0	142
Chad	5,018	2.3	5.9	u	43.0	143
Comoros	444	3.0	6.3	u	50.0	88
Djibouti	350	3.1	6.6	u	45.0	132
Equatorial Guinea	392	2.2	5.7	u	44.0	137
Ethiopia	42,271	1.7	6.0	u	40.0	159
Gambia	745	3.0	6.5	u	41.0	154
Guinea	6,075	2.3	6.2	u	40.2	159
Guinea-Bissau	889	1.9	5.4	u	43.0	143
Lesotho	1,538	2.8	5.8	5	53.4	111
Malawi	7,141	3.2	7.0	7	45.0	163
Mali	8,082	2.8	6.7	5	42.5	180
Mauritania	1,766	2.6	6.5	1	44.0	137
Niger	6,115	2.8	7.1	0	42.5	146
Rwanda	6,102	3.3	8.5	10	46.5	132
Sao Tome	97	2.7	u	u	u	u
Sierra Leone	3,665	2.3	6.5	u	39.0	166
Somalia	6,398	3.6	6.6	u	43.0	143
Sudan	21,818	3.1	6.6	5*	47.8	118
Togo	2,960	3.0	6.1	u	50.5	102
Uganda	15,491	3.3	6.9	u	49.0	112
United Rep. of Tanzania	22,751	3.7	7.1	u	51.0	115
Asia						
Afghanistan	14,519	-2.0	6.9	2	40.5	183
Bangladesh	101,147	2.7	6.2	25	48.6	128
Bhutan	1,362	1.8	5.5	u	45.9	139
Burma	37,544	2.1	4.6	u	57.5	80
Democratic Yemen	2,137	2.8	6.8	u	48.4	135
Laos	3,594	2.3	6.2	u	46.0	122
Maldives	183	3.3	u	u	u	u
Nepal	16,915	2.6	6.2	14	48.3	139
Yemen, North	6,888	2.8	7.1	1	48.4	130
Caribbean						
Haiti	5,922	1.8	5.0	7	52.7	128
Oceania						
Kiribati	64	1.5	u	u	u	u
Samoa	163	1.0	u	u	u	u
Tuvalu	8	1.6	u	u	u	u
Vanuatu	142	3.9	u	u	u	u
Least developed	371,335	2.4	6.2	u	47.1	133
Developing	3,680,188	2.1	4.2	45	57.6	89

*Refers only to North Sudan. Note: u=data unavailable.

ghanistan was the only least developed country to experience a negative growth rate during this period. Medium-variant projections (not shown) indicate that the overall rate of population increase in the least developed countries will rise from now until the late 1990s, when it will reach 2.9 percent annually; in the next century, the growth rate is expected to slow somewhat.

The governments of 22 of the 41 countries, including those of many of the most populous nations (such as Bangladesh and Ethiopia), consider their rates of population growth to be too high, and the governments of 16 of these countries are intervening to slow population growth. Only three of the countries—Bhutan, Equatorial Guinea and Laos—view their growth rates as being too low, and the remaining 16 consider their rates to be satisfactory.

The overall average life expectancy at birth for all 41 countries was 47 years in the first half of the 1980s, up from 44 years in 1970–1975. People living in Sierra Leone had the lowest life expectancy (39 years), while those living in Cape Verde had the highest (59 years). Throughout the remainder of the century, the least developed countries are expected to have a 10-year deficit in life expectancy compared with the other developing countries.

The overall infant mortality rate for the least developed countries averaged 133 deaths per 1,000 live births in 1980–1985, down from 146 per 1,000 in 1970–1975. By the end of the century, this rate is projected to decline by 24 percent, to 103 per 1,000. (In contrast, the infant mortality rate for the rest of the developing world is estimated to be 89 deaths per 1,000.) The governments of 38 of the 41 countries consider their infant mortality levels to be unacceptably high. Only Laos, Rwanda and Yemen perceive their mortality levels to be acceptable.

The gap in fertility levels between the least developed countries and the other developing nations is widening. Fertility levels in the other developing countries have declined steadily, from an overall total fertility rate (TFR) of 5.9 lifetime births per woman in 1965–1970 to one of 4.2 in 1980–1985, but the overall TFR in the least developed countries has remained at about 6.5 over the past two decades. As the table shows, in 1980–1985, the average TFR for all of the 41 countries was 6.2 births per woman, ranging from 4.6 in Burma to 8.5 in Rwanda. According to United Nations estimates, it will take more than 25 years for fertility levels in the least developed countries to reach levels similar to those found currently among the other developing nations.

The governments of 26 of the 41 nations (representing three-quarters of the total population living in the least developed countries) consider current fertility levels in their countries to be too high. Almost all of the other governments are satisfied with their fertility levels. The one exception is the government of Equatorial Guinea, which deems its TFR of 5.7 to be too low.

Owing to high levels of fertility and mortality, the least developed nations have a very young age distribution. In 1985, an estimated 45 percent of the population in these countries were children 14 or younger, 47 percent were between 15 and 60, and only eight percent were 60 or older. Consequently, more than half of the overall population were dependents (either 14 and younger or 60 and older). In 1985, there were 113 dependents for every 100 people in the working years, up considerably from a ratio of 102 per 100 in 1950.

Knowledge of contraceptive methods among women living in the 41 countries varies widely: At least half of all currently married women in eight of the 14 countries that have collected data on contraceptive use are familiar with some method. Contraceptive prevalence remains universally low: In most of the countries for which data are available, fewer than 10 percent of married women currently practice contraception, and in no country does current use rise as high as 30 percent. Further, many women in African countries who do practice contraception rely on the less effective methods.

Nevertheless, there is a growing trend among the governments of the least developed countries to support family planning activities to attain demographic objectives or to promote birthspacing. Many of the governments now support access to modern contraceptive methods: Thirty-three countries provide support directly through government-run clinics; five countries (Benin, Burma, Chad, Mauritania and Somalia) provide indirect support; two countries (Djibouti and Equatorial Guinea) do not limit access to family planning but do not provide any support for it; and only one country (Laos) restricts access to birth control methods.

According to the authors of the report, there is an urgent need to improve the quality and quantity of data for the least developed countries. Further, they point out that because acute poverty exists in combination with very high mortality, fertility and population growth in these countries, "the challenge is . . . to devise appropriate and effective population policies that will bring about more rapid social and economic development."

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Salvadoran Women Begin Contraceptive Use Late, Rely Heavily on Sterilization

Before they start to practice family planning, Salvadoran women are 28 years old, have been married for eight years and already have 2.6 children, on average; in rural areas, they are 32 years old and have four children before initiating contraceptive use. Female sterilization, by far the leading method of fertility regulation in El Salvador, accounts for two-thirds of all contraceptive use. Because family planning is adopted late and is used to limit rather than space births, women still have 4.6 children, on average, and at present rates of childbearing and mortality, the nation's population will double in the next 25 years. These are some of the conclusions of the recent Family Health Survey (FHS), carried out in 1988 by the Asociación Demográfica Salvadoreña (ADS), with the technical assistance of the U.S. Centers for Disease Control (CDC).[1]

Three national fertility surveys have been conducted in El Salvador since 1978. The 1978 Contraceptive Prevalence Survey was based on a sample of 4,076 women aged 15–49.[2] The 1985 Demographic and Health Survey (DHS) was based on a similar group,[3] whereas the 1988 FHS used a sample of women 15–44. To make the results of the three surveys more comparable, the authors of the 1988 survey report excluded women aged 45–49 from the denominators of the 1978 and 1985 surveys. In addition, weighting factors were applied to the 1978 and 1985 data sets to compensate for the exclusion of households that were inaccessible in those years because of security problems. Thus, the 1985 data given here differ slightly from those previously published.

Marriage and Fertility

Marriage begins early in El Salvador. The singulate mean age at marriage was 19.8 in 1985 and 20.3 in 1988 (Table 1, page 78). In both years, 24 percent of 15–19-year-olds were in union at the time of the survey. Consensual union is the more common

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form of marriage. In 1988, 58 percent of all currently married women 15–44 were in a consensual union, and among teenagers, this proportion was 82 percent. Marital breakdown is also common, with about one in seven of all women aged 25–39 having been divorced or separated.

In 1978, the total fertility rate (TFR) was 6.3 lifetime births per woman. The TFR in the year before the 1985 DHS survey was substantially lower (4.5 births per woman), and the rate varied widely by region—3.3 in metropolitan San Salvador and 5.8 in rural areas. Three years later, the TFR was estimated to be 4.6 (3.1 births per woman in the capital region and 5.9 in rural areas). Thus, the fertility decline in El Salvador appears to have stalled.

Of course, the TFR is a synthetic estimate, measuring the hypothetical number of children that Salvadoran women will have if they pass through their reproductive years conforming to the current age-specific fertility rates of each age-group. Salvadoran women aged 40–44 in 1988 (women who had probably completed their childbearing) had had 5.9 children (7.4 in rural areas). These numbers show why the population is still growing at a rate of 2.8 percent per year. The authors of the 1988 survey report conclude that if "fertility and death rates were to remain constant, El Salvador's 1988 population of 5.4 million would double in about 25 years."

Contraceptive Use

In 1978, 34 percent of married women were using a contraceptive method. The leading methods at that time were sterilization (18 percent) and the pill (nine percent). In 1985, contraceptive prevalence was 46 percent among married women 15–44, with two-thirds of contraceptive practice accounted for by female sterilization. By 1988, overall prevalence was only slightly higher, at 47 percent (an increase that is within sampling error), and 63 percent of these users had been contraceptively sterilized. Thus, the authors conclude that between 1985 and 1988, there was no significant increase in contraceptive use in El Salvador. The only other method relied upon by a substantial number of women in El Salvador is the pill, used by seven percent of currently married users in 1985 and by almost eight percent in 1988. Up to age 24, the pill is the leading method among married users, whereas after that age, the preferred method is sterilization.

In the 1988 survey, when the women who were practicing contraception were asked why they were doing so, 72 percent said they did not want any more children, while only 28 percent said they wanted to space births. (The latter proportion was so low presumably because most users were relying on sterilization.) Women under 25, those with only one child, those with 10 or more years of schooling and those using reversible methods, however, gave spacing as the main reason they used a method.

Women are 28 years of age, on average, when they first use a birth control method (having probably been married for about eight years), and they already have a mean of 2.6 children. Rural women, on the other hand, do not practice family planning for the first time until they reach age 32 and already have four children. The mean age at sterilization is 27.4 among married women, and 30 percent of those sterilized have the operation before they are 25 years old. Sterilized women have 3.5 living children, on average, at the time of the operation.

Eighteen percent of nonpregnant, fertile women were not using contraceptives but did not want to be pregnant (the definition of need for family planning services). Using the same criteria, levels of unmet need are highest among married women (30 percent), rural women (28 percent), those with no schooling (30 percent) and those with five or more children (over 32 percent). The total level of unmet need is relatively low because the proportion of fecund married women who are currently breastfeeding or pregnant is relatively high.

Table 1. Selected data from the 1985 Demographic and Health Survey (DHS) and the 1988 Family Health Survey (FHS), El Salvador

Measure	DHS (1985)	FHS (1988)
Mean age at first union	19.8	20.3
% of women 15–19 in union	24.0	23.5
Total fertility rate	4.5	4.6
% of married women practicing contraception	46.3	47.1
% sterilized	30.8	29.6
Duration of breastfeeding (in mos.)	16.0	17.0
Infant mortality rate (per 1,000 live births)	65.0	50.0

Maternal and Child Health

Breastfeeding is nearly universal in El Salvador, with 95 percent of women who had had a child in the two years preceding the 1988 survey reporting that they had breastfed that baby. The mean duration of breastfeeding during that period was 17 months, one month longer than the average duration reported in 1985. On average, women begin giving their babies solid food after about five months and other milk at about 10 months. As is typical in Latin America, the duration of breastfeeding is lowest among the most highly educated; however, between 1985 and 1988, the greatest increase in breastfeeding duration occurred among these women.

In 1985, the infant mortality rate was estimated to be 65 deaths per 1,000 live births. In 1988, the probability of dying in infancy was 50 per 1,000. Between 1985 and 1988, most of the decline in mortality occurred in rural areas, where the rate fell from 81 to 56 deaths per 1,000 live births.

Levels of immunization among young children appear to have remained relatively unchanged between 1985 and 1988. Slightly more children under five received their complete tuberculosis shots in 1988 than in 1985, but the proportion receiving complete vaccinations against polio, diphtheria, tetanus, pertussis and measles declined slightly, especially in urban areas.

Diarrheal infections are still prevalent among young children and babies in El Salvador. In 1988, 29 percent of children under five (and 33 percent of those in rural areas) had suffered from diarrhea during the two weeks before the interview. The authors of the survey report point out that acute diarrhea—a clinical symptom caused by viral, bacterial or parasitic infection—can be spread through fecal contamination of water or food, and is "usually associated with inadequate food handling, inadequate personal hygiene and poor environmental sanitation." Almost nine in 10 recent cases of diarrhea had been treated; however, only 13 percent had been treated with oral rehydration solutions, while nearly 81 percent were treated with popular pharmaceutical preparations and five percent with traditional medications. The researchers comment that it is likely that the "majority of these treatments were either ineffective or deleterious."

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Books in Review

The State of a Continent: Demography in Africa

The State of African Demography

ed. by Etienne van de Walle, Mpembele D. Sala-Diakanda and Patrick O. Ohadike, International Union for the Scientific Study of Population (IUSSP), Liege, 1988, $12.00 ($10.00 IUSSP members), 155 pp.

Reviewed by John C. Caldwell

This very useful collection of essays, available in both English and French, is a credit to its publisher, the International Union for the Scientific Study of Population (IUSSP). The essays focus mainly on Sub-Saharan Africa, a region the editors are well-positioned to review: Etienne van de Walle's program at the Population Studies Center of the University of Pennsylvania is concerned with Tropical Africa; Mpembele Sala-Diakanda heads the francophone United Nations demographic center for the region, Institut de Formation et de Recherche Démographiques; and Patrick Ohadike directs the anglophone United Nations center, Regional Institute of Population Studies. The result of their collaboration, *The State of African Demography*, is straightforward and clear, and would make an excellent textbook.

An appropriate place to begin this review is with the chapters on mortality, given the current claims in the press, with backing from the United Nations Children's Fund (UNICEF), that report a major upturn in infant and child mortality in Africa (related to, among other factors, famine and the economic backlash from large national debts). The studies in this volume, however, contain no evidence that supports such trends.

Althea and Kenneth Hill, for example, emphasize that, even though the extreme unreliability of data makes certainty impossible, all evidence up to 1985 has pointed to declining mortality in every major African region over the last few decades. From the late 1960s through the early 1980s, each year increases in life expectancy for the continent as a whole averaged 0.43 years, and increases in Sub-Saharan Africa were even slightly higher. This pattern is similar to that found for both the population in the developing countries and the population worldwide. The decline in mortality in Africa was achieved over precisely the period when the rains dried up and economic difficulties intensified. Yet it is also true that by the mid-1980s life expectancy on the continent was still no more than 50 years, and if the decline in mortality were to continue at the present pace, it would not reach a satisfactory level of 70 years before the year 2030. However, the most positive aspect of current trends is that declines have been greatest in the highest mortality areas, so that West Africa's rates of mortality are no longer uniformly higher than those of East Africa. The Hills present evidence that the withdrawal of governments from the health sector bottomed out around 1980, and that, subsequently, the proportion of government resources invested in the health sector has begun to rise again.

Douglas Ewbank takes up the theme of health policy in the following chapter. Although he details clearly what should be done, he fails to come to grips with the problem of why it is so often not done.

Allan Hill does a better job in his chapter on famine. It is now clear that rainfall in Africa has been lower over the last 25 years than at any other time during this century (although the 1920s almost compete with the present, and the 1940s were also dry times). In this chapter, the present is starkly contrasted with the wet years of the 1950s, when the continent had the best rainfall in this century. Nevertheless, as Hill emphasizes with a useful map, famine has also been the product of warfare and internal disorder; hunger has both a political dimension and a meteorological one. Hill's research group in Mali found no evidence of the rise of childhood mortality during the Sahelian drought of the early 1970s, but it may be that the unreliability of African age data and the weakness of retrospective reporting make a definite conclusion impossible.

Trends in child mortality in Africa will certainly influence trends in family planning, which are treated in the opening chapters of this volume. In one, Thérèse Locoh writes on the Sub-Saharan African family. She starts with an observation that census data and other official statistics are usually not only inadequate but misleading. Nevertheless, she does attempt to examine trends in the makeup of the African family, but is at her best in her social asides. At times she seems to believe that North Africa and other Third World societies are merely Sub-Saharan Africa at a later stage of development, but this does not prevent her from being sensitive and perceptive about the region. She points out that premarital conceptions and births have usually been welcome; this norm has only recently been challenged by young women's desires to continue their education and training. In any case, entry into marriage has traditionally been a process, rather than an event. High, sustained fertility, not virtue through confining births to marriage, continues to confer status in the region.

Society in Sub-Saharan Africa is characterized by early age at marriage among young women, a large age gap between spouses, and a high incidence of polygyny and marital instability. The volume offers little statistical certainty of persistent changes in any of these characteristics. There is some evidence, however, of an increase in female-headed households,

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which now stand at almost 30 percent in Ghana and Zambia (perhaps an indication of a greater matriarchal focus to families in urban areas). Locoh discusses the finding that child fostering has not declined with increasing education or urbanization. Her analysis shows an understanding of the African viewpoint: "The children that are exchanged for various lengths of time are the true messengers of family solidarity, and they keep alive the links between distant kin" [p. 55]. Although Locoh concedes that fathers suffer little financial strain from high fertility because of their limited economic responsibility, she believes that fertility could fall because of gradual family changes, especially a strengthening of the emotional and economic tie between spouses resulting from the influence of Christianity, or because of the more rapid family changes caused by AIDS. Fertility is also likely to decline once urban women begin making their own family planning decisions.

In a related chapter on fertility and family planning, Hilary Page comes to much the same conclusions from a more theoretical stance. She demonstrates that there is no evidence of fertility decline in any of the countries in continental Sub-Saharan Africa, with the possible exception of Zimbabwe, and even this assumption is challenged. She presents an interesting analysis of the impact of proximate determinants on fertility but places too much emphasis on marriage. In terms of the likelihood of fertility decline, she sees some hope that the husband's complete authority over reproductive decisions will be eroded with a phasing out of payments by the prospective husband to the bride's family, in spite of little evidence of any correlation. She also sees potential for decline in the relationship between increasing female economic responsibility and reproductive decision-making in parts of Kenya, as demonstrated by C. Safilios-Rothschild and E.K. Mburugu,[1] although their finding has yet to be replicated in any other setting.

Three other good chapters are also worth mentioning. Aderanti Adepoju reports on the region's migration patterns and stresses that migration is usually a family decision, not an individual one. He discusses the failure of Mozambique and Tanzania to persuade rural populations who have emigrated to the cities to return to the countryside, and points out that whatever may be said of Tanzania's efforts in the 1970s, its program was the only major initiative on the continent that attempted to put real resources into rural areas.

K.T. de Graft-Johnson presents a masterly summary of censuses and surveys, as well as the organizational effort that has gone into persuading most countries in the region to participate in the decennial census rounds. He points out that data quality did not improve significantly between the 1970 and 1980 rounds and that a complete vital registration system still does not exist in continental Sub-Saharan Africa.

Dominique Tabutin contributes a comprehensive chapter on African training in demography, which he concludes is "coming of age." Somewhat surprisingly, he claims that "in most countries demographic training is given at the graduate level" [p. 142]. Although programs exist in at least one university in every country and in 10 or more universities in Nigeria, the truth is that, at least in the English-speaking countries, the great majority of teaching in demography is at the undergraduate level. Tabutin puts in a plea for the concentration of demography programs in a few good universities, but this has proved impossible, even within the borders of Nigeria.

The IUSSP, the editors and the authors are to be congratulated for assembling a valuable update on the state of African demography. Sadly, these essays also fully support Hilary Page's conclusion that "it is still too early to predict with any accuracy the date at which substantial and sustained fertility declines will become apparent" [p. 43].

Reference

1. C. Safilios-Rothschild and E.K. Mburugu, "Rural Women's Income and Fertility in Kenya," paper presented at the Workshop on Women's Status and Fertility organized by the Rockefeller Foundation at Mount Kisco, N.Y., July 1986.

Changing Patterns of Fertility . . .

(Continued from page 57)

1,4 millones, y el de condones, de 715 millones a prácticamente 2.000 millones. La demanda de anticonceptivos ha de subir también en América Latina, pero no tanto como en otras regiones.

Según cierta proyección, simplemente para mantener el nivel actual de asistencia, el Agencia para el Desarrollo Internacional de los EE.UU. deberá aumentar sus suministros de píldoras al Africa en más de un 300 por ciento. En cuanto a condones, el Agencia tendrá que acrecentar sus entregas al Africa en más del 200 por ciento, al Asia en alrededor del 170 por ciento y a América Latina en casi un 100 por ciento. En el caso del DIU y debido a un aparente exceso de abastecimiento, se espera un menor aumento de la demanda. Entre las consecuencias de estas conclusiones figuran la necesidad de efectuar proyecciones realistas del aumento de anticonceptivos para cada país y la de planificar la forma como el Agencia, otros donantes y los propios países en desarrollo han de sufragar los mayores costos.

Résumé

L'augmentation de la pratique de la planification familiale et des couples en âge de procréer va grandement accroître la demande de moyens anticonceptionnels dans le Tiers monde. On estime que la plus forte augmentation de la prévalence contraceptive se produira en Afrique, où, afin que ce continent puisse maintenir la ventilation actuelle des méthodes et atteindre l'indice synthétique de fécondité moyen estimé par les Nations unies, l'approvisionnement de pilules devra passer de 47 millions de cycles en 1985 à 199 millions pour l'an 2000. En Asie, l'utilisation du stérilet durant cette même période passera de 286.000 unités à presque 1,4 million, et celle des préservatifs passera de 715 millions à pratiquement 2.000 millions. La demande de moyens contraceptifs s'accroîtra aussi en Amérique latine, mais elle sera moindre que dans les autres régions.

Selon certaines prévisions, simplement pour maintenir la même partie de la demande en l'an 2000 qu'en 1985, l'Organisme pour le développement international des Etats-Unis (AID) devra augmenter son approvisionnement de pilules de plus de 300 pour cent. Quant aux préservatifs, l'AID devra accroître son approvisionnement en Afrique de plus de 200 pour cent, en Asie d'environ 170 pour cent et en Amérique latine de presque 100 pour cent. Quant au stérilet, dû à un sur-approvisionnement du dispositif, on espère que l'accroissement de la demande sera moindre. Parmi les implications de ces résultats, figurent la nécessité d'effectuer des projections réalistes de l'augmentation des produits contraceptifs pour chaque pays et celle de planifier la façon dont l'AID, les autres donateurs et les pays en voie de développement eux-mêmes puissent subvenir aux frais qui vont se multiplier.

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